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ABSTRACT

Citations in this bibliography are intended to be a substantial resource for recent investigations (January 1990-November 1994) on nonpoint source pollution and were obtained from a search of the National Agriculture Library's AGRICOLA database. The 196 citations are indexed by author and subject. A representation of the search strategy is included. Citations range in topic and include nonpoint sources, point sources, water quality management, agricultural pollution, water pollution, sources, agricultural production, urban runoff, groundwater, surface water, policy, models, environmental impact, sustainable agriculture, forest management, watershed management, pesticides, nutrients, land use, wetlands, information systems, tillage, erosion, and runoff. Abstracts are provided for some, but not all, entries. Entries include National Agriculture Library call numbers, title, author, publisher or distributor, language, descriptors, and abstract. (LZ)

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ED 382 483

Nonpoint-Source Pollution Issues

January 1990 - November 1994

QB 95-01

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Nonpoint-Source Pollution Issues

January 1990 - November 1994

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196 citations from AGRICOLA

Joe Makuch
Water Quality Information Center

Water Quality

National Agricultural Library Beltsville, Maryland 20705-2351 January 1995

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aZ5071.N3 no.95-01

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Canadian Journal of Soil Science 1988 v 68(1): 17-27
DeJong, R. Comparison of two soil-water models under semi-arid growing conditions
Ver: AGRICOLA
Remarks: Not available at IU or in region.
NAL CA: 56.8 C162

Auth: C. Johnson CCL Maxcost: $15.00

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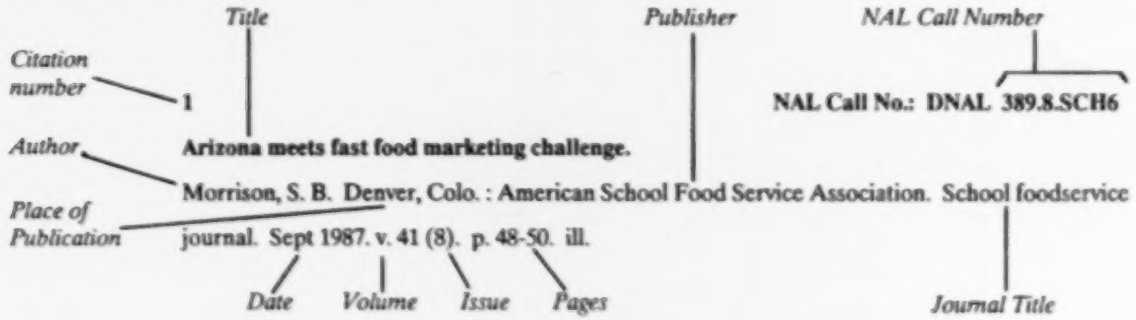
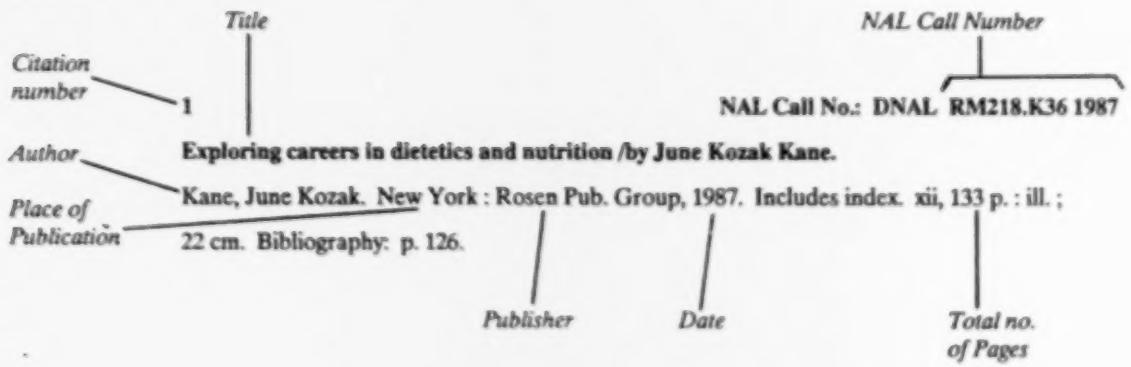
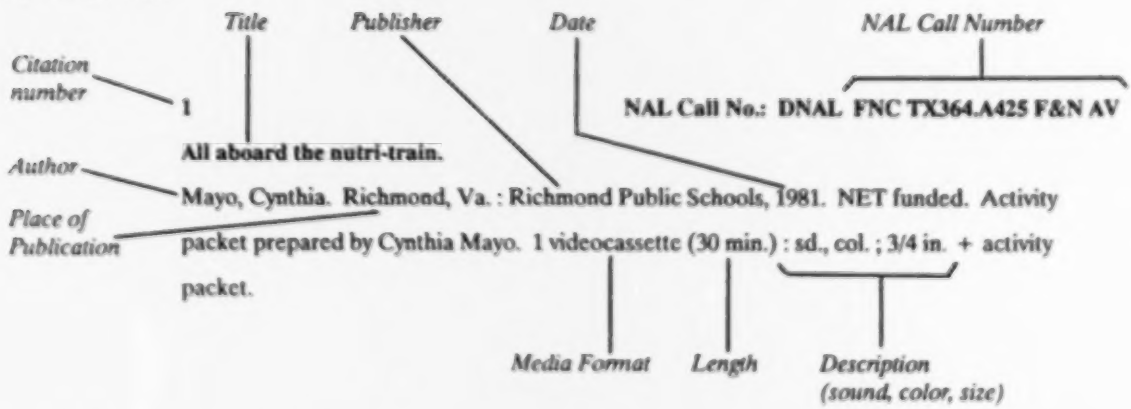


Book:


Title
NAL Call Number
Citation number
1
NAL Call No.: DNAL RM218.K36 1987
Author
Exploring careers in dietetics and nutrition /by June Kozak Kane.
Kane, June Kozak. New York : Rosen Pub. Group, 1987. Includes index. xii, 133 p. : ill. ;
Place of Publication
22 cm. Bibliography: p. 126.
Publisher
Date
Total no. of Pages

Audiovisual:



Nonpoint-Source Pollution Issues

SEARCH STRATEGY

Set	Items	Description
S1	787	(NONPOINT OR NON()POINT)/TI,DE,ID
S2	332443	PY=(1990 OR 1991 OR 1992 OR 1993 OR 1994)
S3	215	S1 AND S2
S4	208	RD S3 (unique items)

Nonpoint-Source Pollution Issues

1 NAL Call No: aTD223.A26 1993
Accomplishments of the USDA hydrologic unit area projects.
Ebodaghe, Denis Abumere,
United States, Agricultural Stabilization and Conservation Service, United States, Extension Service, United States, Soil Conservation Service
Washington, D.C.? : U.S. Dept. of Agriculture, Agricultural Stabilization and Conservation Service : Extension Service : Soil Conservation Service,.
74 [i.e. 128] p. : maps ; 28 cm. Cover title. "Compiled by Denis Ebodaghe", Foreword. June 1993. Alternate pages are numbered.

Language: English

Descriptors: Water quality management; Nonpoint source pollution; Agricultural pollution

2 NAL Call No: TD420.A1P7
Addressing nonpoint sources of water pollution must become an international priority.
Duda, A.M.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 1-11; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Water pollution; Sources; Agricultural production

3 NAL Call No: HD1773.A2N6
Aggregate analysis of site-specific pollution problems: the case of groundwater contamination from agriculture.
Opaluch, J.J.; Segerson, K.
Morgantown, W.Va. : The Northeastern Agricultural and Resource Economics Association.
Northeastern journal of agricultural and resource economics v. 20 (1): p. 83-97; 1991 Apr. Paper submitted in response to call for papers on the theme "The Effects of Agricultural Production on Environmental Quality.". Includes references.

Language: English

Descriptors: Groundwater; Contamination; Water pollution; Agricultural sector; Agricultural policy; Microeconomic analysis; Aggregate data; Site factors; Spatial distribution; Information systems; Mathematical models

4 NAL Call No: aTD428.A37M34 1992
Agricultural nonpoint source pollution and economic incentive policies issues in the reauthorization of the Clean Water Act : water quality.
Malik, Arun S.; Larson, Bruce A.; Ribaudo, Marc
United States, Dept. of Agriculture, Economic Research Service, Resources and Technology Division
Washington, DC : U.S. Dept. of Agriculture, Economic Research Service, Resources and Technology Division,.
iv, 14 p. ; 28 cm. (ERS staff report ; no. AGES 9229.). Cover title. "November 1992", P. iii. Includes bibliographical references (p. 12-14).

Language: English

Descriptors: Agricultural pollution; Water

5 NAL Call No: aS21.R44A7
Agricultural nonpoint-source runoff and sediment yield water quality (NPSWQ) models: modeler's perspective.
Rose, C.W.; Dickinson, W.T.; Ghadiri, H.; Jorgensen, S.E.
Beltsville, Md. : The Service.
ARS - U.S. Department of Agriculture, Agricultural Research Service (81): p. 145-169; 1990 Jun. Paper presented at the International Symposium on Water Quality Modeling of Agricultural Non-Point Sources, part 1, June 19-23, 1988, Logan, Utah. Literature review. Includes references.

Language: English

Descriptors: Soil water movement; Models; Runoff water; Sediment; Agricultural chemicals; Water quality; Literature reviews

6 NAL Call No: 1 Ag84y
Agriculture, agricultural chemicals, and water quality.
Carey, A.E.
Washington, D.C. : U.S. Dept. of Agriculture : For sale by the Supt. of Docs., U.S. G.P.O., [1980-.
The ... yearbook of agriculture. p. 78-85; 1991. In the series analytic: Agriculture and the Environment / edited by D. Takiff Smith.

Language: English

Descriptors: Water quality; Agricultural production; Pesticides; Environmental impact; Water pollution; Point sources; Environmental management; Environmental protection

7 NAL Call No: S589.75.158 1993
Agriculture and the environment papers presented at the International Conference on Agriculture and the Environment 10-13 November 1991.
Edwards, C. A.
International Conference on Agriculture and the Environment 1991.
Amsterdam ; New York : Elsevier,.
xxv, 326 p. : ill., map ; 27 cm. Reprinted from Agriculture, ecosystems and environment, vol. 46 nos. 1-4 (1993). Includes bibliographical references.

Language: English

Descriptors: Agriculture; Sustainable agriculture; Nonpoint source pollution; Pests

8 NAL Call No: 1.90 C20U8
Agriculture's role in addressing nonpoint source pollution.
Burt, J.P.
Washington, D.C. : U.S. Dept. of Agriculture, [1992-.
Agriculture outlook (70th): p. 47-52; 1994. Meeting held November 30 - December 1, 1993, Washington, DC.

Language: English

Descriptors: U.S.A.; Cabt; Pollution; Watersheds; Agricultural production; Environmental legislation

9 NAL Call No: TD171.U5
Albemarle-Pamlico: case study in pollutant trading. Most of the nutrients came from nonpoint sources.
Hall, J.; Howett, C.
Washington, U.S. Environmental Protection Agency.
EPA journal v. 20 (1/2): p. 27-29; 1994.

Language: English

Descriptors: North Carolina; Cabt; Estuaries; Water quality; Pollutants; Nutrients; Nitrogen; Point sources; Nutrient sources; Environmental degradation; Watershed management; Pollution control

10 NAL Call No: TD420.A1P7
Application of a GIS-based nonpoint source nutrient loading model for assessment of land development scenarios and water quality in Owasco Lake, New York.
Heidtke, T.M.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 595-604; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: New York; Cabt; Lakes; Water quality; Phosphorus; Loads; Water pollution; Models; Geographical information systems; Land use

11 NAL Call No: TD172.A7
Assessment of nonpoint source pollution in stormwater runoff in Louisville, (Jefferson County) Kentucky, USA.
Marsh, J.M.
New York, Springer-Verlag.
Archives of environmental contamination and toxicology v. 25 (4): p. 446-455; 1993 Nov. Includes references.

Language: English

Descriptors: Kentucky; Cabt; Storms; Runoff water; Water pollution; Pesticides; Bioassays; Biological indicators; Fish

12 NAL Call No: 407 G29W no.2381-C
Assessment of nonpoint-source contamination of the High Plains aquifer in south-central Kansas, 1987. (Assessment of nonpoint-source contamination, High Plains aquifer, Kansas.)
Helgesen, John O.; Stullken, Lloyd E.; Rutledge, A. T.
Washington, DC : U.S. G.P.O. ; Denver, CO : For sale by U.S. Geological Survey, Map Distribution; I 19.13:2381-C.
v, 51 p. : ill., maps ; 28 cm. (U.S. Geological Survey water-supply paper ; 2381-C Analysis of nonpoint-source ground-water contamination in relation to land use ; ch. C). "Assessment of nonpoint-source contamination, High Plains aquifer, Kansas", Title on p. (4) of cover. Includes bibliographical references (p. 34-36).

Language: English

Descriptors: Land use; Nonpoint source pollution; Groundwater

13 NAL Call No: TD420.A1P7
Assumed non-point water pollution based on the nitrogen budget in Polish agriculture.

Sapek, A.; Sapek, B.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 483-488; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Poland; Cabt; Water pollution; Air pollution; Nitrogen; Agricultural production; Nitrogen balance

14 **NAL Call No: TD427.P35B46 1992**
Best management practices for agricultural nonpoint source control IV Pesticides for the project Rural Nonpoint Source Control Water Quality Evaluation and Technical Assistance (National Water Quality Evaluation Project).
United States, Environmental Protection Agency, Office of Research and Development
Washington, DC : U.S. Environmental Protection Agency, Office of Research and Development; EP 1.2:M 31/8.
xiii, 87 p. ; 28 cm. Shipping list no.: 92-268-P. September, 1984. Bibliography: p. 73-87.

Language: English

Descriptors: Pesticides

15 **NAL Call No: Z5862.2.W3F58 1993**
A bibliography of selected nonpoint source literature.
Flippo, Herbert N.; Jackson, Donald R.
Susquehanna River Basin Commission
Harrisburg, PA (1721 N. Front St., Harrisburg 17102) : Susquehanna River Basin Commission; PY S9642.2 B5825.
i, 81 p. ; 28 cm. (Publication (Susquehanna River Basin Commission) ; no. 148.). January 1993.

Language: English

Descriptors: Nonpoint source pollution

16 **NAL Call No: QH96.8.B5R53 1991**
Biological metric development for the assessment of nonpoint pollution in the Snake River ecoregion of Southern Idaho 1990-1991 final report.
Robinson, Christopher T.; Minshall, G. Wayne
Pocatello : Idaho : Dept. of Biological Sciences, Idaho State University,.
75 p. : ill., map ; 28 cm. 23 April 1991. Includes bibliographical references (p. 70-71).

Language: English

Descriptors: Water quality bioassay; Water quality management; Environmental monitoring

17 **NAL Call No: TD420.A1P7**
Biomonitoring and amelioration of nonpoint source pollution in some aquatic bodies.
Chandra, P.; Tripathi, R.D.; Rai, U.N.; Sinha, S.; Garg, P.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 323-326; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Orissa; Cabt; Uttar pradesh; Cabt; Body water; Water pollution; Water purification; Aquatic plants

18 **NAL Call No: TD224.W6B46 1993**
Brown water, green weeds familiar signs of nonpoint source pollution.
Bennett, Steve
Wisconsin Nonpoint Source Water Pollution Abatement Program
Madison, Wis. : University of Wisconsin Extension, [1993?].
1 folded sheet (4 p.) : ill. ; 28 cm. Caption title. "I-05-93-10M-20-S", P. [4]. "GWQ003", P. [4].

Language: English

Descriptors: Nonpoint source pollution; Water; Urban runoff; Agricultural pollution

19 **NAL Call No: S631.F422**
Changing farm practice to meet environmental objectives of nutrient loss to Oyster Harbour.
Weaver, D.M.; Prout, A.L.
Dordrecht : Kluwer Academic Publishers.
Fertilizer research v. 36 (2): p. 177-184; 1993. In the special issue: Fertilizers and eutrophication in South-Western Australia / edited by E.P. Hodgkin and J.S. Yeates. Includes references.

Language: English

Descriptors: Western australia; Cabt; Watershed management; Agricultural land; Nutrients; Phosphorus; Losses from soil; Point sources; Farm management; Environmental management; Water quality; Eutrophication

Abstract: Eutrophication problems in waterbodies in south-western Australia are primarily caused by inputs of nutrients from diffuse sources within the agricultural catchments of these waterbodies. To reduce the algal growth and seagrass decline caused by these inputs, it is essential to modify land management to minimize nutrient losses. Permanent reduction in nutrient losses from agricultural catchments should involve voluntary changes in farm management practices based on improved land management. Specifically, these include on-farm nutrient management such as soil testing, fertilizer management, the use of perennial plants, and water and erosion control measures to reduce nutrient loss from rural land. This paper describes the management of nutrient loss from the catchment of Oyster Harbour on the south coast of Western Australia using a co-operative approach.

20 NAL Call No: TD224.T4N48 1992
Characterization of non-point sources and loadings to Galveston Bay.
Newell, Charles J.; Rifai, H. S.; Bedient, Philip B., Galveston Bay National Estuary Program
Clear Lake, Tex. : Galveston Bay National Estuary Program; W1137.7 G139 no.15.
2 v. : ill., col. maps ; 28 cm. (GBNEP ; -15). March, 1992. Vol. 2: 28 x 45 cm. Includes bibliographical references (v. 1, p. 155-162).

Language: English

Descriptors: Galveston Bay (Tex.); Environmental impact statements; Watersheds; Land use; Hydrology; Water quality

21 NAL Call No: TD420.A1P7
Chesapeake experience: NPS Chesapeake challenge for sustainable development.
Bauereis, E.I.
Oxford : Pergamon Press.
Water science and technology : a journal of the International Association on Water Pollution Research and Control v. 26 (12): p. 2723-2725; 1992.
In the series analytic: Water Quality International '92. Part 6 / edited by M. Suzuki, et.al. Proceedings of the Sixteeth Biennial Conference of the International Association on Water Pollution Research and Control, held May 24-30, Washington, D.C.

Language: English

Descriptors: Maryland; Sustainability; Water pollution; Body water; Coastal areas

22 NAL Call No: HC79.E5E5
Classification and spatial mapping of riparian habitat with applications toward management of streams impacted by nonpoint source pollution.
Delong, M.D.; Brusven, M.A.
New York, N.Y. : Springer-Verlag.
Environmental management v. 15 (4): p. 565-571; 1991 Jul. Includes references.

Language: English

Descriptors: Idaho; Habitats; Riparian vegetation; Erosion; Pollution; Information systems; Mapping; Watersheds; Farmland

23 NAL Call No: 56.8 J822
Classifying remotely sensed data for use in an agricultural nonpoint-source pollution model.
Jakubauskas, M.E.; Whistler, J.L.; Dillworth, M.E.; Martinko, E.A.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 47 (2): p. 179-183; 1992 Mar. Includes references.

Language: English

Descriptors: Kansas; Water quality; Water pollution; Remote sensing; Watersheds; Simulation models; Landsat; Thematic mapper; Data collection

24 NAL Call No: TD423.C632 1993
Coastal nonpoint pollution control program program development and approval guidance.
United States, National Oceanic and Atmospheric Administration, United States, Environmental Protection Agency, Office of Water
Washington, D.C. : U.S. Environmental Protection Agency,.
ix, 46, [35] p. ; 28 cm. Cover title. January 1993.

Language: English

Descriptors: Water; Coastal zone management

25 NAL Call No: 292.9 Am34
A comparison of runoff quality effects of organic and inorganic fertilizers applied to fescuegrass plots.
Edwards, D.R.; Daniel, T.C.
Bethesda, Md. : American Water Resources Asso-

ciation.
Water resources bulletin v. 30 (1): p. 35-41; 1994 Jan. Includes references.

Language: English

Descriptors: Arkansas; Cabt; Poultry manure; Pig manure; Npk fertilizers; Runoff; Water quality; Festuca arundinacea; Pastures; Pollution

Abstract: Application of fertilizer can degrade quality of runoff, particularly during the first post-application, runoff-producing storm. This experiment assessed and compared runoff quality impacts of organic and inorganic fertilizer application for a single simulated storm occurring seven days following application. The organic fertilizers used were poultry (Gallus gallus domesticus) litter, poultry manure, and swine (Sus scrofa domesticus) manure. All fertilizers were applied at an application rate of 217.6 kg N/ha. Simulated rainfall was applied at 50 mm/h for an average duration of 0.8 h. Runoff samples were collected, composited, and analyzed for nitrate N (NO3-N), ammonia N (NH3-N), total Kjeldahl N (TKN), ortho-P (PO4-P), total P (TP), chemical oxygen demand (COD), total suspended solids (TSS), fecal coliforms (FC), and fecal streptococci (FS). Application of the fertilizers did not alter the hydrologic characteristics of the receiving plots relative to the control plots. Concentrations of fertilizer constituents were almost always greater from treated than from control plots and were usually much greater. Flow-weighted mean concentrations of NH3-N, PO4-P, and TP were highest for the inorganic fertilizer treatment (42.0, 26.6, and 27.9 mg/L respectively). Runoff COD and TSS concentrations were greatest for the poultry litter treatment. Concentrations of FC and FS were greater for fertilized than for control plots with no differences among fertilized plots, but FC concentrations for all treatments were in excess of Arkansas' primary and secondary contact standards. Mass losses of fertilizer constituents were low (< 3 kg/ha) and were small proportions (< 3 percent) of amounts applied.

26 NAL Call No: 290.9 AM32P
A comparison of three nonpoint source pollution models.
Lehman, D.A.; Shirmohammadi, A.; Shoraka, S.
St. Joseph, Mich. : The Society.
Paper - American Society of Agricultural Engineers (90-2038): 36 p.; 1990. Paper presented at the 1990 International Summer Meeting, June 24-27, 1990, Columbus, Ohio. Includes references.

Language: English

Descriptors: Groundwater pollution; Simulation models

27 NAL Call No: LU378.76 L930 1992 cock
A comprehensive assessment of groundwater nitrate pollution from point and non-point sources.
Cockrell, Charles W.
1992.
vii, 67 leaves : ill., maps (some folded) ; 29 cm. Vita. Abstract. Includes bibliographical references (leaves 65-66).

Language: English

Descriptors: Water, Underground; Hazardous waste sites; Wells

28 NAL Call No: S539.5.J68
The concept and need for a phosphorus assessment tool.
Lemunyon, J.L.; Gilbert, R.G.
Madison, WI : American Society of Agronomy, c1987-.
Journal of production agriculture v. 6 (4): p. 483-486; 1993 Oct. Paper presented at the "Symposium on assessment of potential phosphorus losses from a field site", November 4, 1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Resource management; Phosphorus; Losses from soil; Eutrophication; Water pollution; Risk; Assessment; Indexes

29 NAL Call No: TD223.C73 1993
Created and natural wetlands for controlling nonpoint source pollution.
Olson, Richard K.
United States, Environmental Protection Agency, Office of Research and Development, United States, Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds
Boca Raton, Fla. : C.K. Smoley,.
v, 216 p. : ill., maps ; 25 cm. U.S. EPA, Office of Research and Development, and Office of Wetlands, Oceans, and Watersheds. Includes bibliographical references.

Language: English

Descriptors: Water quality management; Water; Wetland conservation; Constructed wetlands

30 NAL Call No: SD1.S63

BEST COPY AVAILABLE

Current southern state programs for control of forestry nonpoint source pollution.
Lickwar, P.M.; Cubbage, F.W.; Hickman, C.A.
Bethesda, Md. : Society of American Foresters.
Southern journal of applied forestry v. 14 (2): p. 64-69; 1990 May. Includes references.

Language: English

Descriptors: South eastern states of U.S.A.; South central states of U.S.A.; Forestry; Pollution; Water composition and quality; Surveys

31 NAL Call No: S494.5.D3C652
A decision support system for soil conservation planning.
Montas, H.; Madramootoo, C.A.
Amsterdam : Elsevier Science Publishers, B.V.
Computers and electronics in agriculture v. 7 (3): p. 187-202; 1992 Sep. Includes references.

Language: English

Descriptors: Quebec; Soil conservation; Watersheds; Land use planning; Decision making; Expert systems; Information systems; Erosion; Simulation models; Rain; Soil types

32 NAL Call No: TD420.A1P7
Determining tradeoffs between water quality and profitability in agricultural production: implications for nonpoint source pollution policy.
Contant, C.K.; Duffy, M.D.; Holub, M.A.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 27-34; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Iowa; Cabt; Water pollution; Sources; Agricultural production; Water quality

33 NAL Call No: S590.C63
Development and implementation of the Virginia agronomic land use evaluation system (values).
Donohue, S.J.; Simpson, T.W.; Baker, J.C.; Monnett, M.M.; Hawkins, G.W.
New York, N.Y. : Marcel Dekker.
Communications in soil science and plant analysis v. 25 (7/8): p. 1103-1108; 1994. Paper presented at the 1993 International Symposium on Soil Testing and Plant Analysis: Precision Nutrient Management, August 14-19, 1993, Olympia, Washington. Part 1.

Language: English

Descriptors: Virginia; Cabt; Fertilizer requirement determination; Soil testing; Nutrients; Management; Databases; Land use; Land evaluation; Water quality; Environmental protection; Water pollution; Pollution control; Point sources

34 NAL Call No: TD420.A1P7 v.28 no.3-5
Diffuse pollution proceedings of the IAWQ 1st International Conference on Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement, held in Chicago, Illinois, USA, 19-24 September 1993., 1st ed.
Olem, Harvey
International Association of Water Quality
IAWQ International Conference of Diffuse Nonpoint Pollution (1st : Chicago, Ill. : 1993).
Oxford ; New York : Pergamon Press,.
xiii, 722 p. : ill., maps ; 25 cm. (Water science and technology v. 28, no. 3-5). On cover: IAWQ, International Association on Water Quality. Includes bibliographical references and index.

Language: English

Descriptors: Nonpoint source pollution

35 NAL Call No: TD420.A1P7
The distributed modelling of agricultural nonpoint pollution at basin scale: experimental research and model validation.
Preti, F.; Lubello, C.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 669-674; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Italy; Cabt; Agricultural chemicals; Application; Rivers; Watersheds; Water pollution; Models

36 NAL Call No: TD223.N36 1992
Document it! Procedures for the documentation of nonpoint source project data, land treatment.
Hermsmeyer, B.
Washington, DC : U.S. Environmental Protection

Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 273-278; 1992.

Language: English

Descriptors: Nebraska; Water pollution; Agricultural land; Residues; Land management; Pollution control; Water management; Documentation

37 NAL Call No: 290.9 Am32T
Drying interval effects on quality of runoff from fescue plots treated with poultry litter.
Edwards, D.R.; Daniel, T.C.; Moore, P.A. Jr; Vendrell, P.F.
St. Joseph, Mich. : American Society of Agricultural Engineers 1958-.
Transactions of the ASAE v. 37 (3): p. 837-843; 1994 May. Includes references.

Language: English

Descriptors: Arkansas; Cabt; Festuca arundinacea; Poultry manure; Drying; Runoff; Pollution; Rainfall simulators

Abstract: Land application of poultry (Gallus gallus domesticus) litter can lead to elevated runoff concentrations of organic matter and nutrients. This experiment was conducted to determine the impacts of poultry litter treatment (0 and 218 kg of N ha-1) and drying interval (4, 7, and 14 days) between litter application and simulated rainfall on quality of runoff from fescue grass (Festuca arundinacea Schreb.) plots. Runoff was generated from simulated rainfall (50 mm h(-1)) and sampled at 0.08-h intervals during runoff. Composite runoff samples from each treatment and replication were analyzed for nitrate N (NO3-N), ammonia N (NH3-N), total Kjeldahl N (TKN), orthor-P (PO4-P), total P (TP), chemical oxygen demand (COD), and total suspended solids (TSS). One set per treatment of the noncomposited runoff samples was also analyzed. Runoff concentrations of all parameters except NO3-N were significantly ($p < 0.05$) higher for the litter-treated plots than for the control plots. Drying interval did not significantly ($p < 0.05$) affect either concentration or total mass of any constituent lost in the runoff. Concentrations of NH3-N, TKN, PO4-P, and TP decreased uniformly with increasing runoff rate and thus with time after beginning of runoff. Temporal variation in runoff concentrations of NO3-N, COD, and TSS followed no identifiable general pattern.

38 NAL Call No: 290.9 Am32P
Dynamic simulation of nonpoint source pollutant transport in agricultural watersheds.
Ashraf, M.S.; Borah, D.K.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (912001): 20 p.; 1991. Paper presented at the "1991 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 23-26, 1991, Albuquerque, New Mexico. Includes references.

Language: English

Descriptors: Water quality; Watersheds; Pollution

39 NAL Call No: 292.9 Am34
Economic incentives for agricultural nonpoint source pollution control.
Malik, A.S.; Larson, B.A.; Ribaudo, M.
Herndon, Va. : American Water Resources Association.
Water resources bulletin v. 30 (3): p. 471-480; 1994 May. Includes references.

Language: English

Descriptors: Water pollution; Pollution control; Environmental legislation; Incentives; Economic policy

Abstract: The limited success of command-and-control policies for reducing nonpoint source (NPS) water pollution mandated under the Federal Water Pollution Control Act (FWPCA) has prompted increased interest in economic incentive policies as an alternative control mechanism. A variety of measures have been proposed ranging from fairly minor modifications of existing policies to substantial revisions including watershed-wide polices that rely on economic incentives. While greater use of economic incentive policies, such as environmental bonds and point/nonpoint source trading is being advocated in the reauthorization of the CWA, the expected effects of individual proposals will be modest. The characteristics of NPS pollution, namely uncertainty and asymmetrical information, underscores that there is no single, ideal policy instrument for controlling the many types of agricultural NPS water pollution. Some of the usual incentive-based policies, such as effluent taxes, are not well suited to the task. Individual incentive policies proposed for the reauthorized CWA, such as pollution trading or deposit/refund systems, are not broadly applicable for heteroge-

neous pollution situations. Economic incentive policies may be appropriate in some cases, and command-and-control policies will be preferable in others and may in fact complement incentive policies.

40 NAL Call No: QD1.A45
Economical monitoring procedure for assessing agrochemical nonpoint source loading in unconsolidated aquifers.
Spalding, R.F.; Exner, M.E.; Burbach, M.E.
Washington, D.C. : The Society.
ACS Symposium series - American Chemical Society (465): p. 255-261; 1991. In the series analytic: Groundwater residue sampling design / edited by R.G. Nash and A.R. Leslie. Includes references.

Language: English

Descriptors: Groundwater; Agricultural chemicals; Piezometers; Sampling; Water pollution

Abstract: Multilevel samplers (MLSs) consisting of piezometers and tube samplers, a logical approach for determining the direction of groundwater flow and chemistry in shallow (< 6 m) nonpoint source (NPS) groundwater investigations. These MLSs have evolved from fastening the tubing to conduit at specific depths while the conduit was lowered into the hollow stem auger train to the present method of installing preassembled MLSs in boreholes drilled by the reverse circulation rotary method without the use of drilling additives. This method allows the aquifer to be sectioned into discrete layers and provides an instantaneous snapshot of both flow and chemistry in three dimensions. The procedure has been used successfully at several sites in Nebraska. The method is cheap, fast, and accurate in areas where the depth to water is less than 6 m. While the same procedure can be used where depths to water exceed 6 m, the need for gas-driven samplers substantially increases the cost.

41 NAL Call No: 56.8 J822
The effect of CRP enrollment on sediment loads in two southern Illinois streams.
Davie, D.K.; Lant, C.L.
Ankeny, Iowa : Soil and Water Conservation Society.
Journal of soil and water conservation v. 49 (4): p. 407-412; 1994 Jul. Includes references.

Language: English

Descriptors: Illinois; Cabt; Soil conservation; Erosion control; Federal programs; Participation; Environmental impact; Sediment; Streams; Water pollution; Point sources

42 NAL Call No: TD420.A1P7
Effective monitoring strategies for demonstrating water quality changes from nonpoint source controls on a watershed scale.
Spooner, J.; Line, D.E.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 143-148; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water quality; Pollution; Sources; Watersheds; Agricultural production; Agricultural land; Treatment

43 NAL Call No: 292.9 Am34
Effects of agricultural nutrient management on nitrogen fate and transport in Lancaster County, Pennsylvania.
Hall, D.W.; Risser, D.W.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 29 (1): p. 55-76; 1993 Jan. Includes references.

Language: English

Descriptors: Pennsylvania; Cabt; Nitrogen; Nitrates; Application to land; Movement in soil; Losses from soil; Water budget; Precipitation; Groundwater; Manures; Fertilizers; Hydrology; Groundwater pollution

Abstract: Nitrogen inputs to, and outputs from, a 55-acre site in Lancaster County, Pennsylvania, were estimated to determine the pathways and relative magnitude of loads of nitrogen entering and leaving the site, and to compare the loads of nitrogen before and after the implementation of nutrient management. Inputs of nitrogen to the site were manure fertilizer, commercial fertilizer, nitrogen in precipitation, and nitrogen in groundwater inflow; and these sources averaged 93, 4, 2, and 1 percent of average annual nitrogen additions, respectively. Outputs of nitrogen from the site were nitrogen in harvested crops, loads of nitrogen

in surface runoff, volatilization of nitrogen, and loads of nitrogen in ground-water discharge, which averaged 37, less than 1, 25, and 38 percent of average annual nitrogen removals from the site, respectively. Virtually all of the nitrogen leaving the site that was not removed in harvested crops or by volatilization was discharged in the ground water. Applications of manure and fertilizer nitrogen to 47.5 acres of cropped fields decreased about 33 percent, from an average of 22,700 pounds per year (480 pounds per acre per year) before nutrient management to 15,175 pounds of nitrogen per year (320 pounds per acre per year) after the implementation of nutrient management practices. Nitrogen loads in ground-water discharged from the site decreased about 30 percent, from an average of 292 pounds of nitrogen per million gallons of ground water before nutrient management to an average of 203 pounds of nitrogen per million gallons as a result of the decreased manure and commercial fertilizer applications. Reductions in manure and commercial fertilizer applications caused a reduction of approximately 11,000 pounds (3,760 pounds per year; 70 70 pounds per acre per year) in the load of nitrogen discharged in ground water from the 55-acre site during the three-year period 1987-1990.

44 NAL Call No: TD223.N36 1992
The effects of temporal and spatial variability on monitoring agricultural nonpoint source pollution.
Johengen, T.H.; Beeton, A.M.
Washington, DC : U.S. Environmental Protection Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 89-95; 1992. Includes references.

Language: English

Descriptors: Michigan; Water pollution; Pesticide residues; Pollution control; Spatial variation; Temporal variation; Monitoring; Water quality

45 NAL Call No: TD223.N36 1992
Elements of a model program for nonpoint source pollution control.
Coffey, S.W.; Spooner, J.; Line, D.E.; Gale, J.A.; Arnold, J.A.; Osmond, D.L.; Humenik, F.J.
Washington, DC : U.S. Environmental Protection Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 361-374; 1992. Includes references.

Language: English

Descriptors: North Carolina; Water quality; Pollution control

46 NAL Call No: TD420.A1P7
Environmental auditing for nonpoint source pollution control in a region of New South Wales (Australia).
Turner, G.W.; Ruffio, R.M.C.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 302-309; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: New South Wales; Cabt; Rural areas; Environmental assessment; Watersheds; Pollution; Sources; Pollution control

47 NAL Call No: 1 Ag84Ab no.664-64
Environmental concerns associated with livestock, dairy, and poultry production. (Issues for the 1990's, environment.)
Christensen, L. A.; Krause, Kenneth R.,
United States, Dept. of Agriculture, Economic Research Service
Washington, D.C.? : U.S. Dept. of Agriculture, Economic Research Service,.
1 sheet (2 p.) ; 28 x 22 cm. (Agriculture information bulletin ; no. 664-64). Caption title. At head of title: Issues for the 1990's: environment. November 1993. Includes bibliographical references.

Language: English

Descriptors: Animal waste; Agricultural pollution; Nonpoint source pollution

48 NAL Call No: 292.8 W295
Estimating changes in recreational fishing participation from national water quality policies.
Ribaudo, M.O.; Piper, S.L.
Washington, D.C. : American Geophysical Union.
Water resources research v. 27 (7): p. 1757-1763;

1991 Jul. Includes references.

Language: English

Descriptors: Water quality; Water policy; Water pollution; Angling; Participation; Estimation; Models

Abstract: The complete evaluation of the offsite effects of national policies or programs that affect levels of agricultural nonpoint source pollution requires linking extensive water quality changes to changes in recreational activity. A sequential decision model is specified to describe an individual's decisions about fishing. A participation model for recreational fishing that includes a water quality index reflecting regional water quality is developed and estimated as a logit model with national level data. A visitation model for those who decide to fish that also includes the water quality index is estimated using ordinary least squares. The water quality index is found to be significant in the participation model but not in the visitation model. Together, the two models provide a means of estimating how changes in water quality might influence the number of recreation days devoted to fishing. The model is used to estimate changes in fishing participation for the Conservation Reserve Program.

49 NAL Call No: QH540.J6

Estimating daily nutrient fluxes to a large Piedmont reservoir from limited tributary data.

Nearing, M.A.; Risse, R.M.; Rogers, L.F.

Madison : American Society Of Agronomy,.

Journal of environmental quality v. 22 (4): p. 666-671; 1993 Oct. Includes references.

Language: English

Descriptors: Georgia; Cabt; Lakes; Water quality; Watersheds; Pollution; Land use; Agricultural land; Stream flow; Nitrate nitrogen; Nitrogen; Phosphorus; Chemical oxygen demand; Variation

Abstract: Physically based models of lakes require estimates of daily, spatially varied water and nutrient fluxes into the lake from surrounding watersheds. Often, however, only a selected set of streams are periodically (monthly or biweekly) sampled. The objective of this study was to develop and test a method for estimating daily flux of nutrients into a large reservoir using data from sampling of selected watersheds. Flow rate, nitrate (NO3-N), total nitrogen (TN), soluble reactive phosphorus (SRP), total phosphorus (TP), and chemical oxygen demand (COD) were measured monthly during 1991 for eight watersheds that feed Lake Lanier in northern Georgia. Daily stream flow in the eight streams was correlated to data from nearby USGS gauged stream stations, and daily nutrient concentrations were related to watershed land use and monthly variation in measured concentrations. Fraction of agricultural land in the watershed (AG) was the only land use parameter that correlated to nonpoint-source loads. Coefficients of determination for linear regressions between AG and NO3-N, TN, SRP, TP, and COD were 0.74, 0.73, 0.47, 0.84, and 0.52, respectively. The relationships were tested on an independent data set consisting of two samples from 19 additional streams. Coefficients of determination (r2) between measured and predicted data for the independent test data was 0.77, 0.52, 0.66, 0.64, 0.69, and 0.76 for stream flow, NO3-N, TN, SRP, TP, and COD, respectively. Percentages of nutrient loads attributable to nonpoint-source loads ranged between 76% for TN to 92% for TP and COD, whereas those attributable to agricultural nonpoint source were about 15% for COD, 28% for TN, 34% for NO3-N, 40% for TP, and 70% for SRP.

50 NAL Call No: 292.9 AM34

Evaluation of best management practices for controlling nonpoint pollution from silvicultural operations.

Lynch, J.A.; Corbett, E.S.

Minneapolis, Minn. : American Water Resources Association.

Water resources bulletin v. 26 (1): p. 41-52; 1990 Feb. Includes references.

Language: English

Descriptors: Forest management; Water pollution; Water composition and quality; Clearcutting; Silviculture

51 NAL Call No: SB317.5.H68

An evaluation of extension programs to enhance water quality through nutrient management in the urban landscape.

Relf, P.D.; McKissack, D.

Alexandria, VA : American Society for Horticultural Science, c1991-.

HortTechnology v. 2 (2): p. 245-247; 1992 Apr. Includes references.

Language: English

Descriptors: Maryland; Cabt; Cooperative extension service; Volunteers; Environmental education; Educational programs; Water quality; Water pol-

lution; Fertilizers; Runoff; Mass media; Extension education; Technology transfer

52 NAL Call No: 290.9 Am32T
Evaluation of GLEAMS and PRZM for predicting pesticide leaching under field conditions.
Zacharias, S.; Heatwole, C.D.
St. Joseph, Mich. : American Society of Agricultural Engineers 1958-.
Transactions of the ASAE v. 37 (2): p. 439-451; 1994 Mar. Includes references.

Language: English

Descriptors: Virginia; Cabt; Zea mays; No-tillage; Pesticides; Leaching; Simulation models

Abstract: Pesticide simulation models, GLEAMS and PRZM, were evaluated for their ability to predict pesticide behavior using field data from a plot under no-till corn in the Coastal Plain region of Virginia. The models were evaluated in an uncalibrated mode as well as with adjustment of important hydrology parameters. The evaluation of model performance was based on graphical displays and statistical measures. Difference in evapotranspiration (ET) predictions by the two models caused the simulated results from their hydrology components to vary. Runoff and soil moisture measured in the field were predicted reasonably well after adjusting important hydrology parameters. Except for differences in magnitude, both models predicted the chemical concentration profiles similarly. Overall, GLEAMS represented pesticide behavior in soil better than PRZM. The models, GLEAMS and PRZM, performed well in predicting pesticide mass in the root zone, but were less reliable in predicting pesticide concentration distributions in soil. Model predictions of pesticide fate and transport were not greatly affected by changes in curve number and the water holding capacity of the soil.

53 NAL Call No: HD1761.A1M5 no.90-62
An evaluation of options for micro-targeting acquisition of cropping rights to reduce nonpoint source water pollution.
Kozloff, Keith
St. Paul, Minn. : University of Minnesota, Institute of Agriculture, Forestry and Home Economics,.
vi, 99 p. : ill. ; 28 cm. (Staff paper P ; 90-62). October 1990. Includes bibliographical references (p. 95-99).

Language: English

54 NAL Call No: 290.9 AM3Ps (IR)
Evaluation of runoff and erosion models.
Wu, T.H.; Hall, J.A.; Bonta, J.V.
New York, N.Y. : American Society of Civil Engineers, c1983-.
Journal of irrigation and drainage engineering v. 119 (2): p. 364-382; 1993 Mar. Includes references.

Language: English

Descriptors: Erosion; Runoff; Sediment yield; Measurement; Simulation models

55 NAL Call No: 292.8 J82
Evaluation of the accuracy and precision of annual phosphorus load estimates from two agricultural basins in Finland.
Rekolainen, S.; Posch, M.; Kamari, J.; Ekholm, P.
Amsterdam : Elsevier Scientific Publishers, B.V.
Journal of hydrology v. 128 (1/4): p. 237-255; 1991 Nov. Includes references.

Language: English

Descriptors: Finland; Agricultural land; Drainage; Runoff; Pollution; Phosphorus; Transport processes; Flow; Estimates; Sampling; Frequency; Monitoring; Mathematical models; Comparisons

Abstract: The accuracy and precision of phosphorus load estimates from two agricultural drainage basins in western Finland were evaluated, based on continuous flow measurements and frequent flow-proportional sampling of total phosphorus concentration during a 2 year period. The objective was to compare different load calculation methods and to evaluate alternative sampling strategies. An hourly data set of concentrations was constructed by linear interpolation, and these data were used in Monte Carlo runs for producing replicate data sets for calculating the accuracy and precision of load estimates. All estimates were compared with reference values computed from the complete hourly data sets. The load calculation methods based on summing the products of regularly sampled flows and concentrations produced the best precision, whereas the best accuracy was achieved using methods based on multiplying annual flow by flow-weighted annual mean concentration. When comparing different sampling strategies, concentrating sampling in high runoff periods (spring and autumn) was found to give better accuracy and precision than strategies based on regular interval sampling throughout the year. However, the best result was obtained by taking samples flow-proportionally within the highest

peak flows plus additional regular interval (e.g. biweekly) samples outside these flow peaks. Using this strategy, which calls for automatic sampling equipment, accuracies better than 5% and precisions better than 10% can be achieved with only 30-50 samples per year.

56 NAL Call No: TD223.N36 1992
Extending the RCWP knowledge base to future nonpoint source control projects.
Robillard, P.D.
Washington, DC : U.S. Environmental Protection Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 375-383; 1992. Includes references.

Language: English

Descriptors: U.S.A.; Water quality; Pollution control

57 NAL Call No: 292.9 Am34
Forest practices as nonpoint sources of pollution in North America.
Binkley, D.; Brown, T.C.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 29 (5): p. 729-740; 1993 Sep. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Canada; Cabt; Water pollution; Streams; Water quality; Forest influences; Forest management

Abstract: Forest management activities may substantially alter the quality of water draining forests, and are regulated as nonpoint sources of pollution. Important impacts have been documented, in some cases, for undesirable changes in stream temperature and concentrations of dissolved oxygen, nitrate-N, and suspended sediments. We present a comprehensive summary of North American studies that have examined the impacts of forest practices on each of these parameters of water quality. In most cases, retention of forested buffer strips along streams prevents unacceptable increases in stream temperatures. Current practices do not typically involve addition of large quantities of fine organic material to streams, and depletion of streamwater oxygen is not a problem; however, sedimentation of gravel streambeds may reduce oxygen diffusion into spawning beds in some cases. Concentrations of nitrate-N typically increase substantially after forest harvesting and fertilization, but only a few cases have resulted in concentrations approaching the drinking-water standard of 10 mg of nitrate- N/L. Road construction and harvesting increase suspended sediment concentrations in streamwater, with highly variable results among regions in North America. The use of best management practices usually prevents unacceptable increases in sediment concentrations, but exceptionally large responses (especially in relation to intense storms) are not unusual.

58 NAL Call No: 99.8 F768
Forest water quality protection: a comparison of regulatory and voluntary programs.
Hawks, L.J.; Cubbage, F.W.; Haney, H.L. Jr; Shaffer, R.M.; Newman, D.H.
Bethesda, Md. : Society of American Foresters.
Journal of forestry v. 91 (5): p. 48-54; 1993 May. Includes references.

Language: English

Descriptors: Maryland; Virginia; Forests; Water quality; Legislation; Resource conservation

59 NAL Call No: 282.9 G7992
Forestry's role in clean water.
Strickler, J.K.
Lincoln, Neb. : The Council.
Proceedings - Great Plains Agricultural Council. p. 43-46; 1990.

Language: English

Descriptors: Kansas; Water quality; Forestry; Riparian forests

60 NAL Call No: Z6004.S94S76 1991
Freshwater wetlands, urban stormwater, and nonpoint pollution control a literature review and annotated bibliography., 2nd ed., rev. and updated.
Stockdale, Erik C.
Washington (State), Dept. of Ecology
Olympia, WA : Washington State Dept. of Ecology,.
v, 267 p. : ill. ; 28 cm. February 1991.

Language: English

Descriptors: Wetlands; Urban runoff; Water; Water quality management

61 NAL Call No: 290.9 AM32P
GIS-based watershed rankings for nonpoint pol-

lution in Pennsylvania.
Hamlett, J.M.; Petersen, G.W.; Russo, J.; Miller, D.A.; Baumer, G.M.; Day, R.L.
St. Joseph, Mich. : The Society.
Paper - American Society of Agricultural Engineers (90-2619): 16 p.; 1990. Paper presented at the "1990 International Winter Meeting," December 18-21, 1990, Chicago, Illinois. Includes references.

Language: English

Descriptors: Pennsylvania; Watersheds; Water pollution; Information systems

62 **NAL Call No: S605.5.A43**
Ground water contamination from agricultural sources: implications for voluntary policy adherence from Iowa and Virginia farmers' attitudes.
Halstead, J.M.; Padgitt, S.; Batie, S.S.
Greenbelt, Md. : Institute for Alternative Agriculture.
American journal of alternative agriculture v. 5 (3): p. 126-133; 1990. Includes references.

Language: English

Descriptors: Iowa; Virginia; Groundwater pollution; Contamination; Agricultural chemicals; Dairy wastes; Water quality; Farmers' attitudes; Questionnaires; Interviews; Farm management; Public opinion; Risk; Health hazards; Environmental impact; Economic impact; Crop production; Dairy farming; Agricultural policy; Programs; Incentives

Abstract: Contamination of ground water from agricultural sources has been documented in a majority of the contiguous United States. In this study, we examine the potential for voluntary adoption of management practices that reduce risk of ground water contamination and discuss how farm operators' attitudes regarding the environment might affect the success of voluntary programs. Farmers' behavior and attitudes in Rockingham County, Virginia, and Big Spring Basin, Iowa, reveal that both groups consider the ground water issue to be a serious problem to which they are contributing. This awareness is a significant first step in prompting consideration of management practices that reduce the threat to ground water quality. We also found that the worst offenders", that is, farmers applying nitrogen well above agronomic recommendations, were those with the least concern about the problem. If major shifts in farming practices are to occur voluntarily, major incentives or disincentives are needed Even though the concern about ground water quality is high, the documented risks perceived by farmers are not strongly convincing. The economic incentives for change are questionable at best. Voluntary adoption of best management practices is only one of several policy options. Ultimately, policies designed to reduce ground water contamination may need a mix of strategies, including economic incentives and disincentives, zoning and land use restrictions, environmental regulations, and bans on agricultural chemicals.

63 **NAL Call No: S590.C63**
Ground water nonpoint source management in Nebraska.
Link, M.
New York, N.Y. : Marcel Dekker.
Communications in soil science and plant analysis v. 23 (17/20): p. 2135-2150; 1992. In the Special Issue: International symposium on soil testing and plant analysis in the global community. Paper presented at the second international symposium, August 22-27, 1991, Orlando, Florida. Includes references.

Language: English

Descriptors: Nebraska; Groundwater pollution; Programs; State government; Water quality; Nitrate; Contamination

64 **NAL Call No: 292.8 W295**
Groundwater as a nonpoint source of atrazine and deethylatrazine in a river during base flow conditions.
Squillace, P.J.; Thurman, E.M.; Furlong, E.T.
Washington : American Geophysical Union, 1965-.
Water resources research v. 29 (6): p. 1719-1729; 1993 Jun. Includes references.

Language: English

Descriptors: Iowa; Cabt; Atrazine; Metabolites; Groundwater; River water; Rivers; Discharge; Water flow; Aquifers; Water pollution

Abstract: Alluvial groundwater adjacent to the main stem river is the principal nonpoint source of atrazine and deethylatrazine in the Cedar River of Iowa after the river has been in base flow conditions for 5 days. Between two sites along a 116-kin reach of the Cedar River, tributaries contributed about 25% of the increase in the atrazine and deethylatrazine load, whereas groundwater from the alluvial aquifer contributed at least 75% of the increase in load. Within the study area, tributaries

aggregate almost all of the discharge from tile drains, and yet the tributaries still only contribute 25% of the increase in loads in the main stem river. At an unfarmed study site adjacent to the Cedar River, the sources of atrazine and deethylatrazine in the alluvial groundwater are bank storage of river water and groundwater recharge from areas distant from the river. Atrazine and deethylatrazine associated with bank storage water will provide larger concentrations to the river during early base flow conditions. After the depletion of bank storage, stable and smaller concentrations of atrazine and deethylatrazine, originating from groundwater recharge, continue to be discharged from the alluvial aquifer to the river; thus these results indicate that alluvial aquifers are an important nonpoint source of atrazine and deethylatrazine in rivers during base flow.

65 NAL Call No: 292.9 AM34

Groundwater discharge and its impact on surface water quality in a Chesapeake Bay inlet.

Reay, W.G.; Gallagher, D.L.; Simmons, G.M. Jr

Bethesda, Md. : American Water Resources Association.

Water resources bulletin v. 28 (6): p. 1121-1134; 1992 Nov. Includes references.

Language: English

Descriptors: Virginia; Groundwater; Discharge; Surface water; Interactions; Sediment; Seepage; Nitrogen; Phosphorus; Agricultural land; Land use; Water quality; Water pollution; Estuaries; Seasonal fluctuations

Abstract: Surface water, groundwater, and groundwater discharge quality surveys were conducted in Cherrystone Inlet, on Virginia's Eastern Shore. Shallow groundwater below agricultural fields had nitrate concentrations significantly higher than inlet surface waters and shallow groundwater underlying forested land. This elevated nitrate groundwater discharged to adjacent surface waters. Nearshore discharge rates of water across the sediment-water interface ranged from 0.02 to 3.69 liters. m-2.hr-1 during the surveys. The discharge was greatest nearshore at low tide periods, and decreased markedly with increasing distance offshore. Vertical hydraulic heads, Eh, and inorganic nitrogen flux in the sediments followed similar patterns. Nitrate was the predominant nitrogen species discharged nearshore adjacent to agricultural land use, changing to ammonium farther offshore. Sediment nitrogen fluxes were sufficient to cause observable impacts on surface water quality; nitrate concentrations were up to 20 times greater in areas of groundwater discharge than in the main stem inlet water. Based on DIN:DIP ratios, nitrogen contributions from direct groundwater discharge and tidal creek inputs appear to be of significant ecological importance. This groundwater discharge links land use activity and the quality of surface water, and therefore must be considered in selection of best management practices and water quality management strategies.

66 NAL Call No: aS21.R44A7

Groundwater quality modeling for agricultural nonpoint sources.

Bogardi, I.; Fried, J.J.; Frind, E.; Kelly, W.E.; Rijtema, P.E.

Beltsville, Md. : The Service.

ARS - U.S. Department of Agriculture, Agricultural Research Service (81): p. 227-252; 1990 Jun. Paper presented at the International Symposium on Water Quality Modeling of Agricultural Non-Point Sources, part 1, June 19-23, 1988, Logan, Utah. Includes references.

Language: English

Descriptors: Groundwater; Groundwater pollution; Models; Agricultural chemicals; Leaching

67 NAL Call No: KF3787.25.U55 1993

Guidance specifying management measures for sources of nonpoint pollution in coastal waters issued under the authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990.

United States. Environmental Protection Agency; United States, Environmental Protection Agency, Office of Water

Washington, DC : U.S. Environmental Protection Agency, Office of Water,.

1 v. (various pagings) : ill. ; 28 cm. January 1993. EPA 840-B-92-002. Includes bibliographical references.

Language: English

Descriptors: Water; Coastal zone management; Marine pollution; Nonpoint source pollution

68 NAL Call No: 292.9 AM34

Herbicide and nitrate variation in alluvium underlying a corn field at a site in Iowa County, Iowa.

Kalkhoff, S.J.; Detroy, M.G.; Cherryholmes, K.L.;

Kuzniar, R.L.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 28 (6): p. 1001-1011; 1992 Nov. Includes references.

Language: English

Descriptors: Iowa; Maize soils; Agricultural land; Alluvium; Aquifers; Agricultural chemicals; Cyanazine; Alachlor; Atrazine; Nitrates; Vertical movement; Seasonal variation; Pollution

Abstract: A hydrologic investigation to determine vertical and seasonal variation of atrazine, alachlor, cyanazine, and nitrate at one location and to relate the variation to ground-water movement in the Iowa River alluvium was conducted in Iowa County, Iowa, from March 1986 to December 1987. Water samples were collected at discrete intervals through the alluvial sequence from the soil zone to the base of the aquifer. Alachlor, atrazine, and cyanazine were detected most frequently in the soil zone but also were present in the upper part of the alluvial aquifer. Alachlor was detected sporadically, whereas, atrazine, cyanazine, and nitrate were present throughout the year. In the alluvial aquifer, the herbicides generally were not detected during 1986 and were present in detectable concentrations for only a short period of time in the upper 1.6 meters of the aquifer during 1987. Nitrate was present throughout the alluvium and was stratified in the alluvial aquifer. The largest nitrate concentrations were detected-in the middle part of the aquifer. Nitrate concentrations were variable only in the upper 2 meters of the aquifer. Vertical movement of herbicides and nitrate in the soil correlated with precipitation and degree of saturation. A clay layer retarded vertical movement of atrazine but not nitrate from the soil layer to the aquifer. Vertical movement could not account for the chemical variation in the alluvial aquifer.

69 NAL Call No: TD420.A1E5
Herbicide transport in rivers: importance of hydrology and geochemistry in nonpoint-source contamination.
Squillace, P.J.; Thurman, E.M.
Washington, D.C. : American Chemical Society.
Environmental science & technology v. 26 (3): p. 538-545; 1992 Mar. Includes references.

Language: English

Descriptors: Iowa; Minnesota; Herbicide residues; Water pollution; River water; Groundwater pollution; Concentration; Models; Overland flow

70 NAL Call No: 292.9 AM34
Hydrologic response of an agricultural watershed to various hydrologic and management conditions.
Razavian, D.
Minneapolis, Minn. : American Water Resources Association.
Water resources bulletin v. 26 (5): p. 777-785. maps; 1990 Oct. Includes references.

Language: English

Descriptors: Nebraska; Watersheds; Agricultural land; Pollution; Tillage; Erosion; Sediment yield; Runoff; Catchment hydrology; Climatic factors; Crop management; Simulation models

Abstract: The hydrologic responses from an agricultural watershed in southeast Nebraska were investigated under an array of physiographic, hydrologic, meteorologic, and management conditions. For analytical purposes, the hydrologic responses were narrowed to include only runoff and sediment yield. The study was performed by utilizing the ANSWERS (Area Nonpoint Source Watershed Environment Response Simulation) hydrologic-simulation model. Results of this study indicate that, generally, nonstructural (agronomic) Best Management Practices (BMPs) have a more significant impact in controlling erosion and nonpoint-source pollution than structurally oriented BMPs. The percentage of reduction in average soil loss as a result of changing tillage systems from conventional to chisel plow was in the mid-40s. The corresponding percentages of reduction in sediment yield from the watershed under minimum tillage and no-till systems were in the mid-60s and mid-80s, respectively. The impact of these management strategies on runoff varied considerably. That is primarily based on the watershed's antecedent soil moisture condition, land use, and the growth stage of crops. Generally, an intense, short, thunderstorm type of rainfall event had more relative impact on runoff, and therefore sediment yield than a long, gentle, and steady event.

71 NAL Call No: TD427.A35S74 1992
Idaho Snake-Payette rivers hydrologic unit ground water quality assessment, West central Idaho Idaho Snake-Payette rivers hydrologic unit planning project, agricultural nonpoint source ground water quality assessment.
Steed, Robert; Winter, Gerry; Cardwell, John

Idaho, Division of Environmental Quality
Boise : Idaho Dept. of Health and Welfare, Division of Environmental Quality,.
iii, 48 p. : ill., maps (some col.) ; 28 cm. (Ground water quality technical report ; no. 3). "IDHW-50, 8/92 48-44-253", Cover. Includes bibliographical references (p. 24-25).

Language: English

Descriptors: Agricultural chemicals; Groundwater; Nonpoint source pollution

72 NAL Call No: 290.9 Am32P
Identifying and managing nonpoint source pollution.
Warriner, M.R.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (932043): 8 p.; 1993. Paper presented at the "1993 International Summer Meeting sponsored by The American Society of Agricultural Engineers, and The Canadian Society of Agricultural Engineering," June 20-23, 1993, Spokane, Washington. Includes references.

Language: English

Descriptors: Pollution; Runoff water; Water quality; Waste water

73 NAL Call No: S601.A34
The impact of fertilizer application techniques on nitrogen yield from two tillage systems.
Mostaghimi, S.; Younos, T.M.; Tim, U.S
Amsterdam : Elsevier.
Agriculture, ecosystems and environment v. 36 (1/2): p. 13-22; 1991 Jun14. Includes references.

Language: English

Descriptors: Virginia; Agricultural land; Hapludults; Silt loam soils; Nitrogen; Losses from soil systems; Sediment; Runoff; Water pollution; No-tillage; Tillage; Nitrogen fertilizers; Subsurface application; Application methods; Artificial precipitation; Rain; Yields; Nitrate nitrogen; Ammonium nitrogen; Kjeldahl method; Eutrophication; Surface water; Movement in soil

74 NAL Call No: S590.C63
Impact of rainfall and tillage systems on off-site herbicide movement.
Shaw, D.R.; Smith, C.A.; Hariston, J.E.
New York, N.Y. : Marcel Dekker.
Communications in soil science and plant analysis v. 23 (15/16): p. 1843-1858; 1992. Includes references.

Language: English

Descriptors: Glycine max; Cropping systems; Tillage; Conservation tillage; Herbicides; Losses from soil; Runoff; Water pollution

75 NAL Call No: S494.5.S86S8
Impacts of uncertainty on policy costs of managing nonpoint source ground water contamination.
Halstead, J.M.; Batie, S.S.; Taylor, D.B.; Heatwole, C.D.; Diebel, P.L.; Kramer, R.A.
Binghamton, N.Y. : Food Products Press.
Journal of sustainable agriculture v. 1 (4): p. 29-48; 1991. Includes references.

Language: English

Descriptors: Virginia; Groundwater pollution; Nitrates; Stochastic models; Stochastic programming; Agricultural policy; Costs

76 NAL Call No: 290.9 AM32T
The importance of precise rainfall inputs in nonpoint source pollution modeling.
Rudra, R.P.; Dickinson, W.T.; Euw, E.L. von
St. Joseph, Mich. : American Society of Agricultural Engineers.
Transactions of the ASAE v. 36 (2): p. 445-450; 1993 Mar. Includes references.

Language: English

Descriptors: Ontario; Agricultural wastes; Losses from soil; Models; Pollutants; Rain; Soil properties

Abstract: Rainfall data provide a prime input in nonpoint source pollution (nps) modeling. The sensitivity of model outputs to variations in the time step selected for rainfall data has been explored for two nps models, a field-scale continuous model, and an event-based watershed-scale model, for the temperate climatic conditions of Southern Ontario, Canada. This study has revealed that model outputs regarding runoff, soil loss and sediment yield, and calibrated parameters representing soil hydraulic properties and erosion characteristics are extremely sensitive to small variations in the rainfall time step. Model users must use caution therefore to take these variations into account during the calibration and application of such models.

77 NAL Call No: 290.9 AM32T
The influence of subsurface drainage practices on herbicide losses.

Bengtson, R.L.; Southwick, L.M.; Willis, G.H.; Carter, C.E.
St. Joseph, Mich. : American Society of Agricultural Engineers.
Transactions of the ASAE v. 33 (2): p. 415-418; 1990 Mar. Includes references.

Language: English

Descriptors: Atrazine; Metolachlor; Water pollution; Subsurface drainage

78 NAL Call No: TD420.A1P7
Integrating water quality modeling with ecological risk assessment for nonpoint source pollution control: a conceptual framework.
Chen, Y.D.; McCutcheon, S.C.; Rasmussen, T.C.; Nutter, W.L.; Carsel, R.F.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 431-440; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water quality; Protection; Pollution control; Ecology; Risk; Assessment; Models

79 NAL Call No: 282.8 J82
Land retirement as a tool for reducing agricultural nonpoint source pollution.
Ribaudo, M.O.; Osborn, C.T.; Konyar, K.
Madison, Wis. : University of Wisconsin Press.
Land economics v. 70 (1): p. 77-87; 1994 Feb. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Land diversion; Pollution control; Agricultural land; Social costs; Mathematical models

80 NAL Call No: HD1761.A1M5 no.90-31
Land use and incentive schemes for nonpoint pollution control in a spatial equilibrium setting.
Graham-Tomasi, Theodore
St. Paul, Minn. : University of Minnesota, Institute of Agriculture, Forestry and Home Economics,.
31 p. ; 28 cm. (Staff paper P; 90-31). April 1990. Includes bibliographical references (p. 31).

Language: English

81 NAL Call No: 100 Or3M no.898
Land use and nonpoint source phosphorus pollution in the Tualatin Basin, Oregon a literature review. (A literature review : land use and nonpoint phosphorus pollution in the Tualatin Basin, Oregon.)
Wolf, Donald W.
Oregon State University, Water Resources Research Institute, Oregon State University, Extension Service
Corvallis, Or. : Water Resources Research Institute : Oregon State University Extension Service; HEO/Ex8.4Sp3:898.
iv, 63 p. : ill. ; 28 cm. (Tualatin River Basin water resources management report ; no. 1; Special report (Oregon State University. Extension Service) ; 898.). Cover title: A literature review : land use and nonpoint phosphorus pollution in the Tualatin Basin, Oregon. "June 1992", Cover. Includes bibliographical references (p. 47-63).

Language: English

Descriptors: Water; Phosphorus; Water quality

82 NAL Call No: HC79.E5E5
Land use change in California, USA: nonpoint source water quality impacts.
Charbonneau, R.; Kondolf, G.M.
New York, N.Y. : Springer-Verlag.
Environmental management v. 17 (4): p. 453-460; 1993 Jul. Includes references.

Language: English

Descriptors: California; Land use; Water quality; Environmental impact; Erosion; Land diversion; Farmland; Watershed management; Water pollution

83 NAL Call No: 292.9 Am34
Laws and programs for controlling nonpoint source pollution in forest areas.
Brown, T.C.; Brown, D.; Binkley, D.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 29 (1): p. 1-13; 1993 Jan. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Water quality; Pollution control; Monitoring; Legislation; Programs; State government; Federal government

Abstract: Recent federal legislation strengthened nonpoint source pollution regulations and helped to support and standardize pollution control efforts. A comprehensive review of current state and federal programs for forest areas reveals a substantial increase in agency water quality protection activities. These new efforts emphasize monitoring to assess the use and effectiveness of best management practices (BMPs). Recent monitoring reveals that BMP use is increasing and that such use typically maintains water quality within standards. However, information is generally lacking about the cost effectiveness of BMP programs. Carefully designed and executed monitoring is the key to better specification of BMPs and more cost effective water quality protection.

84 NAL Call No: 56.8 J822
Low-input agriculture reduces nonpoint-source pollution.
Weinberg, A.C.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 45 (1): p. 48-50. ill; 1990 Jan. Includes references.

Language: English

Descriptors: Agriculture; Sustainability; Environmental impact; Soil conservation; Water conservation

85 NAL Call No: 56.8 J822
Making a difference agencies can, will, do work together to solve nonpoint source pollution problems.
Valentine, J.; Carochi, J.
Ankeny, Iowa : Soil Conservation Society of America, 1946-.
Journal of soil and water conservation v. 48 (5): p. 401-406; 1993 Sep. Includes references.

Language: English

Descriptors: Colorado; Cabt; Streams; Trout; Habitats; Watershed management; Water pollution; Control; Working plans; Erosion control; Geological sedimentation; State government; Federal government; Public agencies; Usda; Cooperation; Problem solving

86 NAL Call No: 290.9 Am32P
Managing agricultural chemicals in groundwater.
Jones, R.L.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (911067): 11 p.; 1991. Paper presented at the "1991 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 23-26, 1991, Albuquerque, New Mexico. Includes references.

Language: English

Descriptors: Groundwater pollution; Agricultural chemicals; Water management; Leaching

87 NAL Call No: QH540.J6
Managing agricultural phosphorus for protection of surface waters: issues and options.
Sharpley, A.N.; Chapra, S.C.; Wedepohl, R.; Sims, J.T.; Daniel, T.C.; Reddy, K.R.
Madison : American Society Of Agronomy,.
Journal of environmental quality v. 23 (3): p. 437-451; 1994 May. Includes references.

Language: English

Descriptors: Phosphorus; Pollution; Soil management; Crop management; Losses from soil; Eutrophication; Runoff; Erosion; Soil fertility; Manures; Pollution control; Watershed management

Abstract: The accelerated eutrophication of most freshwaters is limited by P inputs. Nonpoint sources of P in agricultural runoff now contribute a greater portion of freshwater inputs, due to easier identification and recent control of point sources. Although P management is an integral part of profitable agrisystems, continued inputs of fertilizer and manure P in excess of crop requirements have led to a build-up of soil P levels, which are of environmental rather than agronomic concern, particularly in areas of intensive crop and livestock production. Thus, the main issues facing the establishment of economically and environmentally sound P management systems are the identification of soil P levels that are of environmental concern; targeting specific controls for different water quality objectives within watersheds; and balancing economic with environmental values. In developing effective options, we have brought together agricultural and limnological expertise to prioritize watershed management practices and remedial strategies to mitigate nonpoint-source impacts of agricultural P. Options include runoff and erosion control and P-source management, based on eutrophic rather than agronomic considerations. Current soil test P methods may screen soils on which the aquatic bioavailability of P should be estimated. Lan-

downer options to more efficiently utilize manure P include basing application rates on soil vulnerability to P loss in runoff, manure analysis, and programs encouraging manure movement to a greater hectareage. Targeting source areas may be achieved by use of indices to rank soil vulnerability to P loss in runoff and lake sensitivity to P inputs.

88 NAL Call No: TD420.W374
Managing agricultural pollution using a linked geographical information system and non-point source pollution model.
Morse, G.; Eatherall, A.; Jenkins, A.
London : The Institution,.
Water and environmental management : journal of the Institution of Water and Environmental Management v. 8 (3): p. 277-286; 1994 Jun. Includes references.

Language: English

Descriptors: Pollution; Agriculture; Simulation models; Geographical information systems; Computer software; Prediction

Abstract: This study documents the development of a link between a geographical information system (GIS) and a non-point source pollution model. The GIS ARC/INFO was linked to the agricultural non-point source pollution model and ORACLE data sources. Application of the system is demonstrated using the Bedford-Ouse catchment as a suitable case study. Water quality impacts are predicted from source data describing topography, soils, land use and river network. The model results were in agreement with observed nitrate concentrations at the catchment outlet, and more appropriate data sources are considered to be the main priority for improving model predictive ability. Management scenarios were established to assess the impact of changing agricultural management practices on predicted water quality. The approach has significant potential for the management of agricultural pollution in the UK.

89 NAL Call No: aZ5071.N3
Managing nonpoint sources of pollution, January 1982-July 1990.
Kuske, J.
Beltsville, Md. : The Library.
Quick bibliography series - U.S. Department of Agriculture, National Agricultural Library (U.S.). (91-50): 66 p.; 1991 Mar. Bibliography.

Language: English

Descriptors: Pollution; Sources; Management; Bibliographies

90 NAL Call No: 56.8 J822
Marginal cost effectiveness analysis for agricultural nonpoint source water quality control.
Walker, D.J.; Calkins, B.L.; Hamilton, J.R.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 48 (4): p. 368-372; 1993 Jul. In the special edition: The next generation of U.S. agricultural conservation policy. Paper presented at the conference "The Next Generation of U.S. Agricultural Policy", March 14-16, Kansas City, Missouri. Includes references.

Language: English

Descriptors: Water quality; Water pollution; Pollution control; Sediment; Marginal analysis; Cost effectiveness analysis; Farm management; Furrow irrigation; Return flow

91 NAL Call No: TD420.A1P7
Market and bargaining approaches to nonpoint source pollution abatement problems.
Netusil, N.R.; Braden, J.B.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 35-45; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Sources; Agricultural land; Erosion; Sediment yield; Erosion control; Costs; Contracts; Marketing techniques

92 NAL Call No: 275.29 M36B
Maryland farmers' adoption of best management practices for nonpoint source pollution control.
Lichtenberg, E.; Lessley, B.V.; Howar, H.D.
College Park, Md. : The Service.
Bulletin - Cooperative Extension Service, University of Maryland (345): 17 p.; 1990-1991. Includes references.

Language: English

Descriptors: Maryland; Water pollution; Water quality; Farm management; Runoff; Soil

chemistry; Cost analysis

93 NAL Call No: 292.8 W295
Metamodels and nonpoint pollution policy in agriculture.
Bouzaher, A.; Lakshminarayan, P.G.; Cabe, R.; Carriquiry, A.; Gassman, P.W.; Shogren, J.F.
Washington : American Geophysical Union, 1965-.
Water resources research v. 29 (6): p. 1579-1587; 1993 Jun. Includes references.

Language: English

Descriptors: Herbicides; Agricultural chemicals; Groundwater; Surface water; Water pollution; Water quality; Simulation models; Statistical analysis

Abstract: Complex mathematical simulation models are generally used for quantitative measurement of the fate of agricultural chemicals in soil. But it is less efficient to use them directly for regional water quality assessments because of the large number of simulations required to cover the entire region and because the entire set of simulation runs must be repeated for each new policy. To make regional water quality impact assessment on a timely basis, a simplified technique called metamodeling is suggested. A metamodel summarizes the input-output relationships in a complex simulation model designed to mimic actual processes such as groundwater leaching. Metamodels are constructed and validated to predict groundwater and surface water concentrations of major corn and sorghum herbicides in the Corn Belt and Lake States regions of the United States. The usefulness of metamodeling in the evaluation of agricultural nonpoint pollution policies is illustrated using an integrated environmental economic modeling system. For the baseline scenario, we estimate that 1.2% of the regional soils will lead to groundwater detection of atrazine exceeding 0.12 micrograms/L, which compares well with the findings of an Environmental Protection Agency monitoring survey. The results suggest no-till practices could significantly reduce surface water concentration and a water quality policy, such as an atrazine ban, could increase soil erosion despite the conservation compliance provisions.

94 NAL Call No: SB249.N6
Methods of controlling non-point source pollution from agricultural activity.
Webster, K.T.
Memphis, Tenn. : National Cotton Council of America.
Proceedings - Beltwide Cotton Conferences. p. 516-518; 1993. Meeting held January 10-14, 1993, New Orleans, Louisiana. Includes references.

Language: English

Descriptors: Pollution control; Agricultural chemicals

95 NAL Call No: 56.8 J822
Methods to assess the water quality impact of a restored riparian wetland.
Vellidis, G.; Lowrance, R.; Smith, M.C.; Hubbard, R.K.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 48 (3): p. 223-230; 1993 May. Includes references.

Language: English

Descriptors: Georgia; Water pollution; Animal wastes; Bioremediation; Water quality; Runoff; Riparian forests; Wetlands; Reclamation; Pollution control

96 NAL Call No: 292.8 W295
Microtargeting the acquistion of cropping rights to reduce nonpoint source water pollution.
Kozloff, K.; Taff, S.J.; Wang, Y.
Washington, D.C. : American Geophysical Union.
Water resources research v. 28 (3): p. 623-628; 1992 Mar. Includes references.

Language: English

Descriptors: Minnesota; Agricultural land; Land use; Land management; Watersheds; Water pollution; Water quality; Erosion; Sediment yield; Simulation models; Cost effectiveness analysis

Abstract: Targeting cropland retirement programs to reduce agricultural nonpoint source pollution is accomplished by employing disaggregated information about physical and economic factors that influence the benefits and costs of adopting specific erosion control practices on specific land parcels. The agricultural nonpoint source (AGNPS) model is used in a Minnesota watershed to simulate the relative effectiveness of alternative targeting schemes with respect to budget outlays for annual payments to landowners, reduction in downstream sediment yield and nutrient loss, and reduction in on-site erosion. Cost-effectiveness increased with information on economic factors (the opportunity cost of retiring a parcel of land) as well as on physical factors (contribution of a parcel to downstream

sediment yield). The marginal cost-effectiveness of all schemes decreased as the enrolled proportion of watershed land increased.

97 NAL Call No: TD224.M6M577 1992
Minnesota nonpoint source management progress in federal fiscal year 1992 the 1992 report to U.S. Environmental Protection Agency.
Minnesota Pollution Control Agency; United States, Environmental Protection Agency
St. Paul : The Agency,.
238 p. : maps ; 28 cm.

Language: English

Descriptors: Water quality management; Nonpoint source pollution

98 NAL Call No: QH540.N3
Mitigating nonpoint-source nitrate pollution by riparian-zone denitrification.
Schipper, L.A.; Cooper, A.B.; Dyck, W.J.
Berlin, W. Ger. : Springer-Verlag.
NATO ASI series : Series G : Ecological sciences v. 30: p. 401-413; 1991. In the series analytic: Nitrate contamination: Exposure, consequence, and control / edited by I. Bogardi and R.D. Kuzelka. Proceedings of the NATO Advanced Research Workshop on Nitrate Contamination: Exposure, Consequences, and Control, September 9-14, 1990, Lincoln, Nebraska. Includes references.

Language: English

Descriptors: Nitrate; Nitrate fertilizers; Water pollution; Runoff; Drainage; Denitrification; Denitrifying microorganisms; Lakes; Rivers; Surface water; Soil types (ecological)

99 NAL Call No: QH540.J6
Modeling linked watershed and lake processes for water quality management decisions.
Summer, R.M.; Alonso, C.V.; Young, R.A.
Madison, Wis. : American Society of Agronomy.
Journal of environmental quality v. 19 (3): p. 421-427; 1990 Jul. Includes references.

Language: English

Descriptors: Watersheds; Lakes; Agricultural land; Simulation models; Water quality; Sediment; Nitrogen; Phosphorus; Chlorophyll; Wetlands; Watershed management; Weather; Trends; Farming systems

Abstract: A physically based modeling approach is used to link watershed with lake processes and to simulate their responses to land management and weather conditions. Components of the watershed model, AGNPS (agricultural nonpoint-source model), are hydrology, erosion, sediment transport, transport of nitrogen and phosphorus, and chemical oxygen demand. Using a cellular structure, runoff, sediment, and chemical variables from the watershed provide input to a take model. This one-dimensional model of water bodies simulates temperature stratification, mixing by wind, sedimentation, inflow density current, and algal growth. Unsteady advection-diffusion equations characterize the dynamics of suspended sediment, soluble and sediment-attached N and P, and chlorophyll. This model, AGNPS-LAKE, is driven by random generation of weather conditions on a daily basis. Resulting impacts of alternative management plans are simulated by changing agricultural practices and land use, thereby modifying inflow characteristics to a lake. Modeling capabilities are being tested on eutrophic lakes in Minnesota for the purpose of simulating long-term trends and impacts of best management practices.

100 NAL Call No: aS21.R44A7
Modeling of agricultural nonpoint-source surface runoff and sediment yield, a review from the modeler's perspective.
Leavesley, G.H.; Beasley, D.B.; Pionke, H.B.; Leonard, R.A.
Beltsville, Md. : The Service.
ARS - U.S. Department of Agriculture, Agricultural Research Service (81): p. 171-194; 1990 Jun. Paper presented at the International Symposium on Water Quality Modeling of Agricultural Non-Point Sources, part 1, June 19-23, 1988, Logan, Utah. Includes references.

Language: English

Descriptors: Runoff water; Agricultural chemicals; Sediment; Nutrients; Pesticides; Models; Hydrology

101 NAL Call No: TD1.E2 no.91/039
Modeling of nonpoint source water quality in urban and non-urban areas.
Donigian, Anthony S.; Huber, Wayne C.
Environmental Research Laboratory (Athens, Ga.)
Athens, Ga. : Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency,.
vi, 72 p. : ill. (EPA/600/3 ; 91/039). June 1991. Includes bibliographical references.

Language: English

Descriptors: Water

102 NAL Call No: 290.9 AM3PS (IR)
Movement of nonpoint-source contaminants through heterogeneous soils.
Tracy, J.C.
New York, N.Y. : American Society of Civil Engineers.
Journal of irrigation and drainage engineering v. 118 (1): p. 88-103; 1992 Jan. Includes references.

Language: English

Descriptors: U.S.A.; Groundwater; Groundwater pollution; Pollutants; Movement in soil; Transport processes; Seepage; Soil water content; Simulation; Probabilistic models; Deterministic models; Comparisons

103 NAL Call No: SB482.A4U55 1994
National Park Service activities outside park borders have caused damage to resources and will likely cause more : report to the chairman, Subcommittee on National Parks, Forests, and Public Lands, Committee on Natural Resources, House of Representatives. (Activities outside park borders have caused damage to resources and will likely cause more.)
United States. General Accounting Office; United States, Congress, House, Committee on Natural Resources, Subcommittee on National Parks, Forests, and Public Lands
Washington, D.C. : The Office; GA 1.13:RCED-94-59.
34 p. : ill., map ; 28 cm. Cover title. January 1994. GAO/RCED-94-59. "B-255460", P. 1. Includes bibliographical references.

Language: English

Descriptors: National parks and reserves; Transboundary pollution; Nonpoint source pollution

104 NAL Call No: TD424.8.N65
News-notes the condition of the environment and the control of nonpoint sources of water pollution. [News-notes (Nonpoint Source Information Exchange (U.S.))].
United States, Environmental Protection Agency, Office of Water, Nonpoint Source Information Exchange (U.S.)
Washington, DC : Nonpoint Source Information Exchange, Assessment and Watershed Protection Division, Office of Wetlands, Oceans and Watersheds, Office of Water, U.S. Environmental Protection Agency; EP 2.2:N 42/.
v. ; 28 cm. Issue #27 has title: NPS news-notes. Description based on: #16 (Oct.-Nov. 1991); title from caption.

Language: English

Descriptors: Nonpoint source pollution; Water quality; Watershed management

105 NAL Call No: QH540.N3
Nitrate ground-water modeling for agricultural and other nonpoint spurces.
Kelly, W.E.; Curtis, B.; Adelman, D.
Berlin, W. Ger. : Springer-Verlag.
NATO ASI series : Series G : Ecological sciences v. 30: p. 97-113; 1991. In the series analytic: Nitrate contamination: Exposure, consequence, and control / edited by I. Bogardi and R.D. Kuzelka. Proceedings of the NATO Advanced Research Workshop on Nitrate Contamination: Exposure, Consequences, and Control, September 9-14, 1990, Lincoln, Nebraska. Includes references.

Language: English

Descriptors: Nebraska; Nitrate; Nitrate fertilizers; Groundwater pollution; Groundwater recharge; Farmland; Simulation models

106 NAL Call No: 290.9 Am32P
Nonpoint ground-water pollution potential in Pennsylvania.
Deichert, L.A.; Hamlett, J.M.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (922531): 25 p.; 1992. Paper presented at the "1992 International Winter Meeting sponsored by the American Society of Agricultural Engineers," December 15-18, 1992, Nashville, Tennessee. Includes references.

Language: English

Descriptors: Pennsylvania; Cabt; Groundwater pollution; Models; Wells; Nitrates; Land use

107 NAL Call No: 44.8 J824
Nonpoint pollution from animal sources and shellfish sanitation.
Stelma, G.N. Jr; McCabe, L.J.
Ames, Iowa : International Association of Milk, Food, and Environmental Sanitarians.
Journal of food protection v. 55 (8): p. 649-656; 1992 Aug. Literature review. Includes references.

Language: English

Descriptors: Shellfish; Food sanitation; Water pollution; Fecal flora; Epidemiology; Foodborne diseases; Literature reviews; Zoonoses

Abstract: Many of the microorganisms pathogenic to both animals and man are transmitted via the fecal-oral route. Most of these pathogens could conceivably be transmitted through a shellfish vector. Bacteria potentially transmitted from animal to man via shellfish include most of the salmonellae. Yersinia enterocolitica, Yersinia pseudotuberculosis, Escherichia coli 0157:H7, Campylobacter jejuni, and Listeria monocytogenes. The protozoa most likely to be transmitted this way are Giardia lamblia and Cryptosporidium spp. Because the enteric viruses are highly species-specific, they are not likely to be transmitted from animals to humans. There are environmental data showing that bacterial pathogens shed by both domestic and wild animals have been isolated from shellfish. However, there is little epidemiological evidence that illness outbreaks have been caused by shellfish harvested from waters polluted by animals. Unfortunately, epidemiological observations are of limited value because most illnesses are probably not recorded. In addition, more than half of the recorded outbreaks are of unknown etiology, and more than half of the shellfish implicated in illness outbreaks cannot be traced to their points of origin. More lenient bacteriological standards should not be established for waters affected only by animal pollution until health effects studies have been performed, and an indicator that differentiates between human and nonhuman fecal pollution is available. Most of the pollution that originates from domestic animals could be eliminated by simple and inexpensive measures.

108 NAL Call No: TD420.A1E5
Nonpoint source contamination of the Mississippi River and its tributaries by herbicides.
Pereira, W.E.; Hostettler, F.D.
Washington, D.C. : American Chemical Society.
Environmental science & technology v. 27 (8): p. 1542-1552; 1993 Aug. Includes references.

Language: English

Descriptors: U.S.A.; River water; Water pollution; Herbicide residues

109 NAL Call No: TD420.A1P7
Nonpoint source evaluation for shellfish contamination in the Santa Barbara Channel.
Kolb, H.E.; LaBuddle, G.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 177-181; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: California; Cabt; Shellfish; Microbial contamination; Pollution; Sources; Water pollution

110 NAL Call No: TD424.8.N65
Nonpoint source news-notes. [Nonpoint source news-notes (Washington, D.C. : 1993)].
Terrene Institute
Washington, D. C. : Terrene Institute,.
v. ; 28 cm. Description based on: #29 (May 1993); title from caption.

Language: English

Descriptors: Nonpoint source pollution; Water quality; Watershed management

111 NAL Call No: TD420.A1P7
Nonpoint source (NPS) pollution modeling using models integrated with geographic information systems (GIS).
Engel, B.A.; Srinivasan, R.; Arnold, J.; Rewerts, C.; Brown, S.J.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 685-690; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Pollution; Sources; Watersheds; Rain; Agricultural chemicals; Runoff water; Water pollution; Water erosion; Geographical information systems; Models

112 NAL Call No: TD172.J6
Nonpoint source phosphorus loads to Delaware's lakes and streams.
Ritter, W.F.

New York, N.Y. : Marcel Dekker.
Journal of environmental science and health : Part A : Environmental science and engineering v. 27 (4): p. 1007-1019; 1992 May. Includes references.

Language: English

Descriptors: Delaware; Lakes; Rivers; Water pollution; Phosphorus; Watersheds; Farmland; Forest soils

113 NAL Call No: HC103.Z9W32 1991
Nonpoint source pollution. (Nonpoint source.)
Doyle, Paul; Morandi, Larry B.
National Conference of State Legislatures
Denver, Colo. : National Conference of State Legislatures,.
11 p. ; 28 cm. (Financing clean water.). Caption title. "August 1991.", P. [4] of cover. Running title: Nonpoint source. "Fourth in a series that presents state legislative options to finance water programs.", P. [1]. Includes bibliographical references (p. 10).

Language: English

Descriptors: Water quality management; Water, Underground; Water

114 NAL Call No: 56.8 J822
Nonpoint source pollution impacts of alternative agricultural management practice in Illinois: a simulation study.
Phillips, D.L.; Hardin, P.D.; Benson, V.W.; Baglio, J.V.
Ankeny, Iowa : Soil Conservation Society of America, 1946-.
Journal of soil and water conservation v. 48 (5): p. 449-457; 1993 Sep. Includes references.

Language: English

Descriptors: Illinois; Cabt; Erosion; Carbon; Nutrient balance; Rotations; Water pollution; No-tillage; Alternative farming; Innovation adoption; Simulation models; Zea mays; Glycine max; Crop yield; Nitrogen; Phosphorus; Runoff

115 NAL Call No: 290.9 Am32P
Nonpoint source pollution model for agricultural watersheds.
Borah, D.K.; Ashraf, M.S.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (922044): 24 p.; 1992. Paper presented at the "1992 International Summer Meeting sponsored by The American Society of Agricultural Engineers," June 21-24, 1992, Charlotte, North Carolina. Includes references.

Language: English

Descriptors: Water quality; Watersheds; Pollution

116 NAL Call No: KF3790.A5N66 1992
Nonpoint source water pollution causes, consequences, and cures.
National Center for Agricultural Law Research and Information (U.S.),Arkansas Water Resources Research Center
Fayetteville, Ark. : National Center for Agricultural Law Research and Information, University of Arkansas School of Law,.
1 v. (various pagings) : ill. ; 30 cm. At head of title: Conference handbook. "October 30-31, 1992", T.p. Includes bibliographical references.

Language: English

Descriptors: Water; Water, Underground; Agricultural pollution; Agriculture

117 NAL Call No: TD223.A1N67 1992
Nonpoint source water quality contacts 1992 directory. (NPS directory.)
Conservation Technology Information Center, United States, Soil Conservation Center
West Lafayette, IN : The Center,.
20 p. ; 28 cm. Cover title. Running title: NPS directory. "Published with the assistance of the USDA Soil Conservation Service", P. 20. State Soil and Water Conservation Agencies, State Water Quality Agencies, USDA Soil Conservation Service, Cooperative Extension Service, USDA Agricultural Stabilization & Conservation Service, State Coastal Zone Management Agencies, U.S. Environmental Protection Agency.

Language: English

Descriptors: Water quality; Water quality management; Water

118 NAL Call No: TD419.5.N66 1991
Nonpoint Source Watershed Workshop. (Nonpoint source solutions.)
United States, Environmental Protection Agency, Office of Research and Development, United States, Environmental Protection Agency, Office of Water, Center for Environmental Research Information (U.S.),Eastern Research Group, Inc
Nonpoint Source Watershed Workshop 1991 : New Orleans, La.

Washington, D.C. : EPA,.
vi, 209 p. : ill., maps ; 28 cm. (Seminar publication). "Technology transfer. "Nonpoint source solutions", Cover. "United States Environmental Protection Agency, Office of Research and Development, Office of Water", P. 1 of cover. "September 1, 1991. EPA/625/4-91/027. Includes bibliographical references.

Language: English

Descriptors: Water quality; Water; Watershed management

119 **NAL Call No: TD419.R47**
Nonpoint sources.
Spooner, J.; Coffey, S.W.; Brichford, S.L.; Arnold, J.A.; Smolen, M.D.; Jennings, G.D.; Gale, J.A.
Alexandria, Va. : The Federation.
Research journal of the Water Pollution Control Federation v. 63 (4): p. 527-536; 1991 Jun. Literature review. Includes references.

Language: English

Descriptors: Water pollution; Groundwater; Surface water; Land use; Activity; Agricultural land; Forest soils; Urban areas; Economics; Planning; Water quality; Water resources; Models; Reviews

120 **NAL Call No: TD419.R47**
Nonpoint sources.
Line, D.E.; Osmond, D.L.; Coffey, S.W.; Arnold, J.A.; Gale, J.A.; Spooner, J.; Jennings, G.D.
Alexandria, VA : Water Environment Federation.
Water environment research : a research publication of the Water Environment Federation v. 66 (4): p. 585-601; 1994 Jun. Includes references.

Language: English

Descriptors: Water pollution; Soil pollution; Water quality; Water resources; Pollutants; Pesticides; Biodegradation; Pollution control; Models; Monitoring; Literature reviews

121 **NAL Call No: S671.A66**
Nutrient losses through tile drains from two potato fields.
Madramootoo, C.A.; Wiyo, K.A.; Enright, P.
St. Joseph, Mich. : American Society of Agricultural Engineers.
Applied engineering in agriculture v. 8 (5): p. 639-646; 1992 Sep. Includes references.

Language: English

Descriptors: Quebec; Solanum tuberosum; Agricultural soils; Tile drainage; Nutrients; Losses from soil; Water pollution; Water quality

Abstract: Two tile-drained potato (Solanum tuberosum L.) fields, approximately 5 ha (12.35 ac) each, at St. Leonard d'Aston, Quebec, were instrumented to measure tile drain flow over two growing seasons (April to November). The soil type was a St. Jude sandy loam. Nitrogen (N), phosphorus (P), and potassium (K) concentrations in tile drain flow were monitored throughout the growing seasons. Nitrogen concentrations ranging from 1.70 to 40.02 mg/L were observed. Phosphorus concentrations ranged from 0.002 to 0.052 mg/L. On one field, it was found that K concentrations were always less than 10 mg/L. However, on the other field, concentrations were mostly greater than 10 mg/L. At the end of the growing season, in the final year of the project, the total amounts of N which were removed by the subsurface drainage systems of the two fields were 14 kg/ha (12.5 lb/ac) and 70 kg/ha (62.5 lb/ac).

122 **NAL Call No: S11.N672 Suppl. no.7**
Okonomiske analyser av tiltak mot fosforavrenning fra dyrket mark = Economic analyses of measures against phosphorus runoff from nonpoint agricultural sources. (Economic analyses of measures against phosphorus runoff from nonpoint agricultural sources.)
Johnsen, Fred Hakon
As, Norge : Statens fagtjeneste for landbruket,.
118 p. : ill. ; 25 cm. (Norsk landbruksforsking = Norwegian agricultural research. Supplement ; no. 7). Summary and abstract in English. Includes bibliographical references (p. 113-118).

Language: Norwegian

123 **NAL Call No: aS21.R44A7**
Opus: an integrated simulation model for transport of nonpoint-source pollutants at the field scale: volume I. Documentation.
Smith, R.E.
Beltsville, Md. : The Service.
ARS - U.S. Department of Agriculture, Agricultural Research Service (98): 135 p.; 1992 Jul. Includes references.

Language: English

Descriptors: Pollution; Pollutants; Transport processes; Movement in soil; Hydrology; Computer simulation; Simulation models; Water flow; Meteorological factors; Growth models

124 NAL Call No: GB980.C53 1993
Paired watershed study design.
Clausen, John C.; Spooner, Jean
United States, Environmental Protection Agency, Office of Water
Washington, D.C. : U.S. Environmental Protection Agency, Office of Water,.
8 p. : ill. ; 29 cm. Caption title. "Prepared by Dr. John C. Clausen ... and Dr. Jean Spooner", P. 8. September 1993. 841-F-93-009. Includes bibliographical references (p. 8).

Language: English

Descriptors: Watersheds; Water quality; Nonpoint source pollution

125 NAL Call No: 292.8 W295
Partitioning solute transport between infiltration and overland flow under rainfall.
Havis, R.N.; Smith, R.E.; Adrian, D.D.
Washington, D.C. : American Geophysical Union.
Water resources research v. 28 (10): p. 2569-2580; 1992 Oct. Includes references.

Language: English

Descriptors: Pollutants; Solutes; Transport processes; Infiltration; Overland flow; Rain; Surface water; Soil depth; Interactions; Mathematical models; Field experimentation

Abstract: Solute transport from soil to overland flow is an important source of nonpoint pollution and was investigated through tracer studies in the laboratory and at an outdoor laboratory catchment. The depth of surface water interaction with soil, defined as the mixing zone is a useful value for approximate estimation of potential solute transport into surface water under rainfall. It was measured in the laboratory for a noninfiltration case (0.90 to 1.0 cm) and estimated through mass balance modeling for an infiltration case (0.52 and 0.73 cm). At an outdoor laboratory catchment, mixing zones were calculated through calibration of a numerical model that describes unsteady, uniform, infiltration and chemical transport. Overland flow was simulated using kinematic wave theory. Mixing zone depths ranged from 0.47 to 1.02 cm and were a linear function of rainfall intensity. Also, the fraction of solute present in the mixing zone at the time of ponding which was extracted into overland flow was a linear function of the initial soil moisture content. A steady state analytical approximation of the solute transport model was also developed which overpredicted solute transport into overland flow by 1 to 60%.

126 NAL Call No: 292.9 AM34
Patterns of periphyton chlorophyll a in an agricultural nonpoint source impacted stream.
Delong, M.D.; Brusven, M.A.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 28 (4): p. 731-741; 1992 Jul. Includes references.

Language: English

Descriptors: Idaho; Streams; Water pollution; Agriculture; Nutrients; Pollutants; Algae; Chlorophyll

Abstract: An agricultural nonpoint source polluted stream in northern Idaho was examined to determine seasonal and longitudinal patterns of periphyton chlorophyll alpha. Chlorophyll alpha was measured at eight sites along Lapwai Creek, a fifth order stream impacted by agricultural runoff containing nutrients and eroded soils. Seasonally, periphyton chlorophyll alpha was lowest in the spring (cumulative x(-) = 60.4 mg m(-2)) and highest in the summer (cumulative average = 222 mg m(-2)). Winter concentrations were higher than expected (cumulative average = 168.6 mg m(-2)). The headwaters, flowing through an open grassy meadow, had the lowest concentrations of the study (two-year average = 49.7 mg m(-2)). Immediately below a small, eutrophic reservoir, periphyton chlorophyll alpha increased markedly (two-year average = 155.8 mg m(-2)) and remained high through a deep canyon (two year average = 135.5 mg m(-2)) and down to the mouth of the stream (two-year average = 172.3 mg(-2)). Periphyton chlorophyll alpha in Lapwai Creek was at least two times greater than values reported in the literature for comparable, undisturbed Idaho streams. We suggest that increased nutrient concentrations via agricultural nonpoint source pollution and increased light penetration from the removal of large, woody riparian vegetation have resulted in high periphyton chlorophyll alpha along the continuum of Lapwai Creek.

127 NAL Call No: QH545.A1E58
Pesticide concentration patterns in agricultural drainage networks in the Lake Erie basin.
Richards, R.P.; Baker, D.B.
Tarrytown, N.Y. : Pergamon Press.
Environmental toxicology and chemistry v. 12 (1): p. 13-26; 1993 Jan. Includes references.

Language: English

Descriptors: Ohio; Pesticides; Water pollution; Trends; Agricultural land; Watersheds; Rivers; Runoff; Storms; Chemical properties; Application methods; Temporal variation; Variation; Pollutants; Land use; Water quality

128 NAL Call No: 292.8 J82
Pesticide residues in ground water of the San Joaquin Valley, California.
Domagalski, J.L.; Dubrovsky, N.M.
Amsterdam : Elsevier Scientific Publishers, B.V.
Journal of hydrology v. 130 (1/4): p. 299-338; 1992 Jan. Includes references.

Language: English

Descriptors: California; Groundwater; Groundwater pollution; Pesticides; Pesticide residues; Leaching; Agricultural soils; Soil properties

Abstract: A regional assessment of non-point-source contamination of pesticide residues in ground water was made of the San Joaquin Valley, an intensively farmed and irrigated structural trough in central California. About 10% of the total pesticide use in the USA is in the San Joaquin Valley. Pesticides detected include atrazine, bromacil, 2,4-DP, diazinon, dibromochloropropane, 1,2-dibromoethane, dicamba, 1,2-dichloropropane, diuron, prometon, prometryn, propazine and simazine. All are soil applied except diazinon. Pesticide leaching is dependent on use patterns, soil texture, total organic carbon in soil, pesticide half-life and depth to water table. Leaching is enhanced by flood-irrigation methods except where the pesticide is foliar applied such as diazinon. Soils in the western San Joaquin Valley are fine grained and are derived primarily from marine shales of the Coast Ranges. Although shallow ground water is present, the fewest number of pesticides were detected in this region. The fine-grained soil inhibits pesticide leaching because of either low vertical permeability or high surface area; both enhance adsorption on to solid phases. Soils of the valley floor tend to be fine grained and have low vertical permeability. Soils in the eastern part of the valley are coarse grained with low total organic carbon and are derived from Sierra Nevada granites. Most pesticide leaching is in these alluvial soils, particularly in areas where depth to ground water is less than 30 m. The areas currently most susceptible to pesticide leaching are eastern Fresno and Tulare Counties. Tritium in water molecules is an indicator of aquifer recharge with water of recent origin. Pesticide residues transported as dissolved species were not detected in non-tritiated water. Although pesticides were not detected in all samples containing high tritium, these samples are indicative of the presence of recharge water that interacted with agricultural soils.

129 NAL Call No: TD420.A1P7
Phosphorus export from nonpoint sources in the Berg River, Western Cape Province, South Africa.
Bath, A.J.; Marais, G.V.R.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 713-718; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: South Africa; Cabt; River water; Water pollution; Phosphorus; Pollution; Sources; Models

130 NAL Call No: QH540.J6
Phosphorus loads from selected watersheds in the drainage area of the Northern Adriatic Sea.
Vighi, M.; Soprani, S.; Puzzarini, P.; Menghi, G.
Madison, Wis. : American Society of Agronomy.
Journal of environmental quality v. 20 (2): p. 439-444; 1991 Apr. Includes references.

Language: English

Descriptors: Adriatic sea; Italy; Watersheds; Phosphorus fertilizers; Leaching; Erosion; Topography

Abstract: The Po Valley is one of the most productive agricultural areas in Europe and P losses from fertilizers are often accused of being among the main factors responsible for eutrophication of the Northern Adriatic Sea. To quantify nonpoint phosphorus loads in this area, 15 small watersheds were studied. Thirteen watersheds were in the intensive agricultural area near the coast and two watersheds were in the forested mountains. Land use in the watersheds was carefully examined and P loads from various sources were theoretically evaluated and experimentally measured. The results indicate fertilization does not increase the losses of P through leaching from the coastal soils,

where the measured release were in the range 0.03 to 0.21 kg P/ha per year with a mean value of about 0.1 kg P/ha per year. There is, however, a greater loss of P through soil erosion from the mountain watersheds (0.6 kg/ha per year). It can be concluded that the control of point sources must take priority over nonpoint sources in efforts to reduce accelerated eutrophication of the Northern Adriatic Sea.

131 **NAL Call No: S539.5.J68**
Phosphorus movement in the landscape.
Sharpley, A.N.; Daniel, T.C.; Edwards, D.R.
Madison, WI : American Society of Agronomy, c1987-.
Journal of production agriculture v. 6 (4): p. 492-500; 1993 Oct. Paper presented at the "Symposium on assessment of potential phosphorus losses from a field site", November 4, 1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Agricultural land; Landscape; Phosphorus; Losses from soil; Movement in soil; Runoff; Erosion; Transport processes; Application to land; Fertilizer requirement determination; Water pollution

132 **NAL Call No: HC79.E5N3**
Point/nonpoint source pollution reduction trading: an interpretive survey.
Letson, D.
Albuquerque, N.M. : University of New Mexico School of Law.
Natural resources journal v. 32 (2): p. 219-232; 1992. Includes references.

Language: English

Descriptors: U.S.A.; Water pollution; Cost control; Literature reviews

133 **NAL Call No: 280.8 J822**
Point/nonpoint source trading of pollution abatement: choosing the right trading ratio.
Malik, A.S.; Letson, D.; Crutchfield, S.R.
Ames, Iowa : American Agricultural Economics Association.
American journal of agricultural economics v. 75 (4): p. 959-967; 1993 Nov. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Pollution control; Law enforcement; Costs; Water quality; Trading; Uncertainty; Mathematical models; Ratios

Abstract: In programs for trading pollution abatement between point and nonpoint sources, the trading ratio specifies the rate at which nonpoint source abatement can be substituted for point source abatement.The appropriate value of this ratio is unclear because of qualitative differences between the two classes of sources. To identify the optimal trading ratio, we develop and analyze a model of point/nonpoint trading. We find the optimal trading ratio depends on the relative costs of enforcing point versus nonpoint reductions and on the uncertainty associated with nonpoint loadings. The uncertainty does not imply a lower bound for the optimal trading ratio.

134 **NAL Call No: A281.9 Ag8A no.674**
Point-nonpoint source trading for managing agricultural pollutant loadings prospects for coastal watersheds.
Letson, David; Crutchfield, Stephen R.; Malik, Arun S.
United States, Dept. of Agriculture, Economic Research Service
Washington, DC : U.S. Dept. of Agriculture, Economic Research Service,.
vii, 14 p. : ill., map ; 28 cm. (Agricultural economic report ; no. 674). Cover title. "September 1993", P. [iii]. Water quality. Includes bibliographical references (p. 13-14).

Language: English

Descriptors: Water quality management; Agricultural pollution; Nonpoint source pollution

135 **NAL Call No: 292.9 AM34**
The political economy of agriculture, ground water quality management, and agricultural research.
Roberts, R.S.; Lighthall, D.R.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 27 (3): p. 437-446; 1991 May. Includes references.

Language: English

Descriptors: Corn belt of U.S.A.; Iowa; Groundwater pollution; Water quality; Agricultural chemicals; Agricultural production; Water management; Agricultural research; Agricultural policy

Abstract: The growing problem of nonpoint source ground water contamination from agricultural chemicals is conceptualized as an historical out-

come of the production environment of capitalist agriculture in the Corn Belt. Chronic overproduction and ground water contamination reveal different aspects of the same technological treadmill. The debate over Iowa's 1987 Ground Water Protection Act symbolizes the contradiction between popular demand for clean water and structural limits on policymaking. Although the Act does provide for expanded research, education, and monitoring, a coalition of commercial farmers, local chemical dealers, and the national chemical industry defeated a tax on pesticide use. Analysis of alternate policy responses, Best Management Practices (BMPs), cross compliance, site-specific regulation of chemical use, and taxation of synthetic chemicals, reveals that all tend to founder on the same structural constraints. Without practical, profitable, low-input technologies that farmers, over time, would choose to adopt, both voluntary and regulatory approaches encounter major political or implementation difficulties. The public agricultural research agenda, therefore, emerges as a central control variable for ground water quality management and a central focus for political struggle.

136 NAL Call No: DISS 91-12,446
Poplar tree buffer strips grown in riparian zones for biomass production and nonpoint source pollution control.
Licht, Louis Arthur
1990.
xviii, 173 leaves : ill., maps ; 28 cm. Includes bibliographical references (leaves 166-173).

Language: English

Descriptors: Water quality management; Biomass energy; Soils; Riparian flora

137 NAL Call No: HD101.S6
Prababilistic cost effectiveness in agricultural nonpoint pollution control.
McSweeney, W.T.; Shortle, J.S.
Experiment, Ga. : The Association.
Southern journal of agricultural economics - Southern Agricultural Economics Association v. 22 (1): p. 95-104; 1990 Jul. Includes references.

Language: English

Descriptors: Virginia; Maize; Soybeans; Wheat; Nitrogen; Pollution by agriculture; Water pollution; Runoff control; Water composition and quality; Farm management; Watersheds; Cost analysis; Tillage; No-tillage; Linear programming; Probabilistic models; Case studies

Abstract: Conceptual weaknesses in the use of costs of average abatement as a measure of the cost effectiveness of agricultural nonpoint pollution control are examined. A probabilistic alternative is developed. The focus is on methods for evaluating whole-farm pollution control plans rather than individual practices. As a consequence, the analysis is presented in a chance-constrained activity analysis framework because activity analysis procedures are a practical and well developed device for screening farm plans. Reliability of control is shown to be as important as reduction targets in designing farm plans for pollution control. Furthermore, broad-axe prescriptions of technology in the form of Best Management Practices may perform poorly with respect to cost effectiveness.

138 NAL Call No: S590.C63
Precision nutrient management, impact on the environment and needs for the future.
Swader, F.; Woodward, M.
New York, N.Y. : Marcel Dekker.
Communications in soil science and plant analysis v. 25 (7/8): p. 881-888; 1994. Paper presented at the 1993 International Symposium on Soil Testing and Plant Analysis: Precision Nutrient Management, August 14-19, 1993, Olympia, Washington. Part 1. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water quality; Water pollution; Point sources; Pollution control; Nutrients; Management; Application to land; Environmental protection; Profitability; Trends; Regulations; Sustainability

139 NAL Call No: TD420.A1P7
Predicting attainable water quality using the ecoregional approach.
Schonter, R.; Novotny, V.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 149-158; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Wisconsin; Cabt; Water quality; Body

water; Protection; Integrated systems; Water resources; Water management; Ecosystems; Prediction; Models

140 NAL Call No: 56.8 J822
Predicting spatial distributions of nitrate leaching in northeastern Colorado.
Wylie, B.K.; Shaffer, M.J.; Brodahl, M.K.; Dubois, D.; Wagner, D.G.
Ankeny, Iowa : Soil and Water Conservation Society.
Journal of soil and water conservation v. 49 (3): p. 288-293; 1994 May. Includes references.

Language: English

Descriptors: Colorado; Cabt; Agricultural land; Nitrate nitrogen; Leaching; Spatial distribution; Groundwater pollution; Nitrate; Contamination; Prediction; Simulation models; Geographical information systems; Point sources

141 NAL Call No: NBULD3656 1991 T749
Preferences of nonpoint source groundwater protection programs by Nebraska's Natural Resources Districts. (University of Nebraska, Lincoln thesis : Community and Regional Planning.)
Trewhitt, Thomas R.
1991.
vi, 131 leaves : ill. ; 28 cm. Includes bibliographical references.

Language: English

Descriptors: Water, Underground; Water districts; Water resources development

142 NAL Call No: 56.8 J822
Prescription planning: an approach to nonpoint pollution problems.
Carlson, C.G.; Dean, R.; Lemme, G.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 45 (2): p. 239-241. ill; 1990 Mar. Includes references.

Language: English

Descriptors: Surface water; Water resources; Aquifers; Water pollution

143 NAL Call No: 292.9 AM34
Problem of nonpoint source agricultural water pollution: toward a hypothetical federal legislative solution.
Caulfield, H.P. Jr
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 27 (3): p. 447-452; 1991 May. Includes references.

Language: English

Descriptors: Groundwater pollution; Agricultural chemicals; Drinking water; Water quality; Environmental legislation; Federal government; Politics; Decision making

Abstract: A conceptual framework of politics is set forth in relation to the federal environmental legislative process. This framework for analysis is then related to a hypothetical public problem, ground water pollution from agricultural chemicals. The public problem from the perspective of political analysis is found to involve several different types of difficult issues with which the legislative process must deal if legislation is to be enacted.

144 NAL Call No: TD223.N36 1992
Proceedings the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : September 13-17, 1992, Orlando, Florida. (Seminar publication : the National Rural Clean Water Program Symposium National RCWP Symposium 10 years of controlling agricultural nonpoint source pollution Ten years of controlling agricultural nonpoint source pollution.)
South Florida Water Management District, United States, Environmental Protection Agency
National RCWP Symposium 1992 : Orlando, Fla.
Washington, DC : U.S. Environmental Protection Agency, Office of Research and Development : Office of Water,.
vii, 400 p. : ill., maps ; 28 cm. Cover title: Seminar publication : the National Rural Clean Water Program Symposium. August 1992. EPA/625/R-92/006. Includes bibliographical references.

Language: English

Descriptors: Water quality; Water; Water-supply, Rural

145 NAL Call No: 290.9 AM32P
Production systems to reduce nonpoint source pollution.
Donald, J.O.; Martin, J.B.; Gilliam, C.H.
St. Joseph, Mich. : The Society.
Paper - American Society of Agricultural Engineers (90-2059): 13 p.; 1990. Paper presented at the "1990 International Summer Meeting spon-

sored by the American Society of Agricultural Engineers," June 24-27, Columbus, Ohio. Includes references.

Language: English

Descriptors: Alabama; Poultry manure; Agricultural wastes; Composting; Feed supplements; Pollution; Waste utilization

146 NAL Call No: ArUKF5627.A314P767 1991
Proposed guidance specifying management measures for sources of nonpoint pollution in coastal waters, proposed under the authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990.
United States, Environmental Protection Agency, Office of Water
Washington, D. C. : United States Environmental Protection Agency, Office of Water,.
1 v. (various pagings) : ill. ; 28 cm. Includes bibliographical references.

Language: English

Descriptors: Coastal zone management; Water; Marine pollution

147 NAL Call No: HD1.A3
Quantifying soil erosion for the Shihmen Reservoir watershed, Taiwan.
Lo, K.F.A.
Oxford : Elsevier Applied Science Publishers.
Agricultural systems v. 45 (1): p. 105-116; 1994. Includes references.

Language: English

Descriptors: Taiwan; Cabt; Watersheds; Erosion; Sediment; Nutrients; Flow; Transport processes; Sediment yield; Simulation models

148 NAL Call No: GB701.W375 no.91-4027
Regional assessment of nonpoint-source pesticide residues in ground water, San Joaquin Valley, California.
Domagalski, Joseph L.; Dubrovsky, N. M.
Geological Survey (U.S.),San Joaquin Valley Drainage Program
Sacramento, Calif. : U.S. Geological Survey ; Denver, CO : Books and Open-File Reports Section [distributor],.
v, 64 p. : ill., maps ; 28 cm. (Water-resources investigations report ; 91-4027 Regional aquifer-system analysis). Includes bibliographical references (p. 38-41).

Language: English

Descriptors: Water, Underground; Pesticides

149 NAL Call No: TD223.7.E29 1992
Regional nonpoint source program summary environmental Protection Agency Region 10 : Alaska - Idaho - Oregon - Washington - Colville Confederated Tribes.
Edwards, Rick; Partee, Grover; Fleming, Fred
Seattle, Wash. : Water Division, Watershed Section, U.S. Environmental Protection Agency, Region 10,.
1 v. (various pagings) : maps, [1992]. Five maps on folded leaves in pocket. November 1992. Includes bibliographical references (p. G1-G2).

Language: English

Descriptors: Nonpoint source pollution; Watershed management

150 NAL Call No: 99.8 F768
Regulation and perceived compliance: nonpoint pollution reduction programs in four states.
Floyd, D.W.; MacLeod, M.A.
Bethesda, Md. : Society of American Foresters.
Journal of forestry v. 91 (5): p. 41-44, 46-47; 1993 May. Includes references.

Language: English

Descriptors: Forest management; Pollution control; Regulations; Legislation

151 NAL Call No: HC79.P55J6
The regulation of non-point source pollution under imperfect and asymmetric information.
Cabe, R.; Herriges, J.A.
Orlando, Fla. : Academic Press.
Journal of environmental economics and management v. 22 (2): p. 134-146; 1992 Mar. Includes references.

Language: English

Descriptors: Pollution; Control methods; Agricultural chemicals; Information; Costs; Reliability; Bayesian theory; Regulations; Taxes; Farmers' attitudes; Beliefs; Mathematical models

Abstract: This paper develops a Bayesian framework for discussing the role of information in the design of non-point-source pollution control mechanisms. An ambient concentration tax is examined, allowing for spatial transport among multiple zones. Imposition of the tax requires costly measurement of concentrations in selected zones,

and the selection of zones for measurement must be undertaken without perfect information regarding several parameters of the problem. Potentially crucial information issues discussed include: (a) the impact of asymmetric priors regarding fate and transport. (b) the cost of measuring ambient concentration, and (c) the optimal acquisition of information regarding fate and transport.

152 NAL Call No: 57.09 F41
Regulation update, clean water & phosphogypium.
Johnson, K.
Glen Arm, Md. : Fertilizer Industry Round Table. Proceedings /. p. 98-100; 1992. Meeting held on October 26-28, 1992, Baltimore, Maryland.

Language: English

Descriptors: Phosphogypsum; Fertilizer industry; Water pollution; Pollution control; Regulations; Point sources

153 NAL Call No: TD419.5.R44 1991
Remote sensing and GIS applications to nonpoint source planning workshop proceedings, Quality Inn Downtown, Chicago, Illinois, October 1-3, 1990.
United States, Environmental Protection Agency, Region V, Northeastern Illinois Planning Commission
Washington, D.C. : Terrene Institute,.
iv, 124 p. : ill., maps ; 28 cm. April 1991. Includes bibliographical references.

Language: English

Descriptors: Water; Geographic information systems; Watershed management

154 NAL Call No: TD223.N36 1992
Research needs and future vision for nonpoint source projects.
Robillard, P.D.; Clausen, J.C.; Flaig, E.G.; Martin, D.M.
Washington, DC : U.S. Environmental Protection Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 385-392; 1992. Includes references.

Language: English

Descriptors: U.S.A.; Water quality; Pollution control; Water management

155 NAL Call No: aS21.R44A7
A review of groundwater models for assessment and prediction of nonpoint-source pollution.
Duffy, C.J.; Kincaid, C.T.; Huyakorn, P.S.
Beltsville, Md. : The Service.
ARS - U.S. Department of Agriculture, Agricultural Research Service (81): p. 253-278; 1990 Jun. Paper presented at the International Symposium on Water Quality Modeling of Agricultural Non-Point Sources, part 1, June 19-23, 1988, Logan, Utah. Includes references.

Language: English

Descriptors: Groundwater; Groundwater pollution; Models; Leaching; Assessment

156 NAL Call No: TD426.R49 1991
A review of methods for assessing nonpoint source contaminated ground-water discharge to surface water.
United States, Environmental Protection Agency, Ground-Water Protection Division, United States, Environmental Protection Agency, Office of Water
Washington, D.C. : U.S. Environmental Protection Agency, Office of Water,.
99 p. : ill. ; 28 cm. April 1991. "EPA 570/9-91-010", Cover. Includes bibliographical references.

Language: English

Descriptors: Water; Water, Underground

157 NAL Call No: 1.98 AG84
Reviving the Chesapeake Bay.
Comis, D.
Washington, D.C. : The Service.
Agricultural research - U.S. Department of Agriculture, Agricultural Research Service v. 38 (9): p. 4-11. ill; 1990 Sep.

Language: English

Descriptors: Delaware; Maryland; Virginia; Water pollution; Estuaries; Runoff; Agricultural land; Sewage effluent; Nutrients; Aquatic organisms

158 NAL Call No: HD1750.W4
Risk considerations in the reduction of nitrogen fertilizer use in agricultural production.
Lambert, D.K.
Lincoln, Neb. : Western Agricultural Economics Association.
Western journal of agricultural economics v. 15 (2): p. 234-244; 1990 Dec. Includes references.

Language: English

Descriptors: Arizona; Cotton; Farm income; Nitrogen fertilizers; Pollution; Economic impact; Application rates; Quantity controls; Production functions; Crop production; Taxes

159 NAL Call No: TD420.A1P7
River salination due to non-point contribution of irrigation return flow in the Breede River, Western Cape Province, South, Africa.
Flugel, W.A.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 193-197; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: South Africa; Cabt; River water; Salinization; Pollution; Sources; Irrigation; Irrigation systems; Return flow

160 NAL Call No: TD224.W6L56 1993
Rural conservation practices for cleaner water.
Linquist, Perry; Korb, Gary; Katona, Juli
Madison, Wis. : University of Wisconsin Extension, [1993?].
[8] p. : ill. ; 28 cm. Caption title. "GWQ010", P. [8]. "I-05-93-5M-20-S", P. [8].

Language: English

Descriptors: Agricultural pollution; Nonpoint source pollution

161 NAL Call No: 99.8 F7623
Salicaceae family trees in sustainable agroecosystems.
Licht, L.A.
Ottawa : Canadian Institute of Forestry.
The Forestry chronicle v. 68 (2): p. 214-217; 1992 Apr. Paper presented at "Contribution of Salicaceae Family to Ameliorating our Environment." Joint Popular Council of Canada/US Popular Council Annual Meeting held Sept. 26-29, 1991, Ottawa, Ontario, Canada. Includes references.

Language: English

Descriptors: Iowa; Salicaceae; Populus; Sustainability; Strip cropping; Groundwater; Water quality; Nitrates; Nitrogen; Nutrient uptake; Ecosystems

Abstract: Research at the University of Iowa is testing the ECOLOTREE BUFFER, a prototype wooded buffer strip planted between a creek and row-cropped land with roots grown intentionally deep enough to intersect the near-surface water table. This project demonstrates that Populus spp. trees cultured by using this technique are both ecologically sustaining and productive. Measured data prove that nitrate is removed from near-surface groundwater and that the nitrogen uptake is present as protein in the leaves and the woody stems. The tree's physiological attributes contribute to a harvested value that can "pay its way"; these include fast wood growth, cut-stem rooting, resprouting from a stump, phreatophytic roots, and a high protein content in the leaves. The wooded riparian strip changes the local agroecosystem by reducing fertilizer nutrients causing surface water eutrophication, by diversifying wildlife habitat, by reducing soils erosion caused by wind and water, by diversifying the crop base, by creating an aesthetic addition in the landscape. This idea is a potential technique for managing non-point source pollutants created by modern farming practices.

162 NAL Call No: TD420.A1P7
Sampling of non-point source contamination in high-capacity wells.
Zlotnik, V.A.; Spalding, R.F.; Exner, M.E.; Burbach, M.E.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 409-413; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Nebraska; Cabt; Irrigation; Wells; Groundwater pollution; Nitrates; Atrazine; Concentration; Sampling

163 NAL Call No: S539.5.J68
Seasonal phosphorus losses in runoff from a coastal plain soil.
Truman, C.C.; Gascho, G.J.; Davis, J.G.; Wauchope, R.D.
Madison, WI : American Society of Agronomy,

c1987-.
Journal of production agriculture v. 6 (4): p. 507-513; 1993 Oct. Paper presented at the "Symposium on assessment of potential phosphorus losses from a field site", November 4, 1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Georgia; Cabt; Coastal plain soils; Agricultural soils; Phosphorus; Losses from soil; Runoff; Water pollution

164 **NAL Call No: QD241.T6**
Septic tank and agricultural non-point source pollution within a rural watershed.
Hayes, S.; Newland, L.; Morgan, K.; Dean, K.
London : Gordon and Breach Science Publishers.
Toxicological and environmental chemistry v. 26 (1-4): p. 137-155; 1990. Includes references.

Language: English

Descriptors: Texas; Water pollution; Watersheds; Reservoirs; Rural areas; Septic tank effluent; Pollution by agriculture; Chemical analysis; Ammonia; Phosphates; Fecal coliforms; Streptococcus; Aerial photography

165 **NAL Call No: aZ5071.N3**
Simulation models, GIS and nonpoint, source pollution: January 1991-December 1993.
Makuch, J.; Emmert, B.
Beltsville, Md., National Agricultural Library.
Quick bibliography series - National Agricultural Library (94-06): 78 p.; 1994 Feb. Updates QB 92-69.

Language: English

Descriptors: Simulation models; Agricultural chemicals; Water quality; Bibliographies

166 **NAL Call No: aZ5071.N3**
Simulation models, GIS and nonpoint-source pollution, January 1988-June 1992.
Holloway, D.; Makuch, J.
Beltsville, Md. : The Library.
Quick bibliography series - U.S. Department of Agriculture, National Agricultural Library (U.S.). (92-69): 43 p.; 1992 Sep. Bibliography.

Language: English

Descriptors: Simulation models; Information systems; Groundwater pollution; Agricultural chemicals; Bibliographies

167 **NAL Call No: 292.9 AM34**
Simulation of sediment and plant nutrient losses by the CREAMS water quality model.
Yoon, K.S.; Yoo, K.H.; Soileau, J.M.; Touchton, J.T.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 28 (6): p. 1013-1021; 1992 Nov. Includes references.

Language: English

Descriptors: Alabama; Gossypium hirsutum; Conservation tillage; Tillage; Erosion; Runoff; Nitrogen; Phosphorus; Losses from soil; Water quality; Water pollution; Catchment hydrology; Simulation models; Prediction

Abstract: CREAMS was applied to a field-sized watershed planted to cotton in the Limestone Valley region of northern Alabama. The field was cultivated for three years with conventional tillage (CvT) followed by three years or conservation tillage (CsT). CREAMS is composed of three components: hydrology, erosion, and chemistry. Surface runoff and losses of sediment, N and P were simulated and results were compared with the observed data from the watershed. Curve numbers recommended in the CREAMS user's guide were not adequate for the watershed conditions. The hydrology submodel improved runoff simulation from CvT and CsT when field-data based curve numbers were used. The erosion submodel demonstrated that CsT reduced sediment loss more than CvT, even though CsT had higher runoff than CvT. The nutrient submodel based on the simulated runoff and sediment underpredicted N loss for both CvT and CsT. This submodel, however, accurately predicted P loss for CvT, but underpredicted for CsT (50 percent lower than the observed). The results of CREAMS simulation generally matched the observed order of magnitude for higher runoff, lower sediment, and higher N and P losses from CsT than from CvT.

168 **NAL Call No: 275.29 IO9PA**
Soil information related to nonpoint pollution.
Miller, G.A.
Ames, Iowa : The Service.
PM - Iowa State University, Cooperative Extension Service v.): 6 p.; 1992 Sep.

Language: English

Descriptors: Iowa; Soil types; Soil parent materials; Soil texture; Erodibility; Profiles; Soil surveys;

Topsoil; Characteristics; Environmental factors

169 NAL Call No: 292.9 Am34
A spatial decision support system for assessing agricultural nonpoint source pollution.
Srinivasan, R.; Engel, B.A.
Herndon, Va. : American Water Resources Association.
Water resources bulletin v. 30 (3): p. 441-452; 1994 May. Includes references.

Language: English

Descriptors: Texas; Cabt; Pollution; Watersheds; Runoff; Erosion; Geographical information systems; Simulation models; Integrated systems

Abstract: A spatial decision support system (SDSS) was developed to assess agricultural nonpoint source (NPS) pollution using an NPS pollution model and geographic information systems (GIS). With minimal user interaction, the SDSS assists with extracting the input parameters for a distributed parameter NPS pollution model from user-supplied GIS base layers. Thus, significant amounts of time, labor, and expertise can be saved. Further, the SDSS assists with visualizing and analyzing the output of the NPS pollution simulations. Capabilities of the visualization component include displays of sediment, nutrient, and runoff movement from a watershed. The input and output interface techniques/algorithms used to develop the SDSS, along with an example application of the SDSS, are described.

170 NAL Call No: 56.8 J822
Special protection areas: a new nonpoint-source management option in Nebraska.
Ehrman, R.L.; Link, M.L.; Gottula, J.J.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 45 (2): p. 263-264; 1990 Mar. In subseries: Case studies in rural groundwater management. Throughout the nation innovative programs in response to rural groundwater quality issues. Includes references.

Language: English

Descriptors: Nebraska; Groundwater flow; Water quality; Water pollution; Protection

171 NAL Call No: 56.8 J822
Statewide GIS-based ranking of watersheds for agricultural pollution prevention.
Hamlett, J.M.; Miller, D.A.; Day, R.L.; Peterson, G.W.; Baumer, G.M.; Russo, J.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 47 (5): p. 399-404; 1992 Sep. Includes references.

Language: English

Descriptors: Pollution; Watersheds; Ranking; Computer techniques; Models; Databases; Geography

172 NAL Call No: SD356.6.M35S96 1993
Summary of current state nonpoint source control practices for forestry. (Current NPS control practices for forestry Current state nonpoint source control practices for forestry.)
Tetra Tech, inc, United States, Environmental Protection Agency, Office of Water, United States, Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds
Washington, DC : U.S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds,.
iv, 168 p. ; 28 cm. Running title: Current NPS control practices for forestry. August 1993. "United States Environmental Protection Agency, Office of Water", Cover. EPA-841/S-93-001. "EPA Contract Number 68-C3-0303", P. ii.

Language: English

Descriptors: Forest management; Forests and forestry

173 NAL Call No: TD420.A1P7
Sustainable agriculture: impacts on nonpoint pollution.
Hatfield, J.L.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 415-424; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Sustainability; Farming; Farming systems; Natural resources; Use efficiency; Pollution control

174 NAL Call No: 292.9 AM34
Targeting remedial measures to control nonpoint source pollution.

Dickinson, W.T.; Rudra, R.P.; Wall, G.J.
Minneapolis, Minn. : American Water Resources Association.
Water resources bulletin v. 26 (3): p. 499-507; 1990 Jun. Includes references.

Language: English

Descriptors: Ontario; Pollution by agriculture; Erosion; Sedimentation; Losses from soil systems; Erosion control; Soil and water conservation; Sediments; Watersheds; Upland areas; Lowland areas; Computer software

175 NAL Call No: 290.9 Am32P
Targeting Virginia's nonpoint source programs.
Hession, W.C.; Flagg, J.M.; Wilson, S.D.; Biddix, R.W.; Shanholtz, V.O.
St. Joseph, Mich. : American Society of Agricultural Engineers,.
Paper / (922092): 15 p.; 1992. Paper presented at the "1992 International Summer Meeting sponsored by the American Society of Agricultural Engineers," June 21-24, 1992, Charlotte, North Carolina. Includes references.

Language: English

Descriptors: Water quality; Pollution

176 NAL Call No: 282.9 G7992
Task force findings and recommendations for enhancing Great Plains water quality.
Lacewell, R.D.
Lincoln, Neb. : The Council.
Proceedings - Great Plains Agricultural Council. p. 62-68; 1992. Meeting held June 9-11, 1992 in Lincoln, Nebraska.

Language: English

Descriptors: Northern plains states of U.S.A.; Southern plains states of U.S.A.; Groundwater; Surface water; Water quality; Environmental impact; Water pollution; Water policy

177 NAL Call No: 275.9 N213
Teaching soil conservation and non-point source pollution.
Dickinson, W.T.; Rudra, R.P.; Wall, G.J.
Urbana, Ill. : National Association of Colleges and Teachers of Agriculture.
NACTA journal v. 34 (1): p. 52-56. maps; 1990 Mar. Includes references.

Language: English

Descriptors: Agricultural education; Teaching; Soil conservation; Simulation models; Soil pollution

178 NAL Call No: TD420.A1P7
Technical guidance for implementing BMPS in the Coastal zone.
Frederick, R.E.; Dressing, S.A.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 129-135; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Coastal areas; Technical aid; Guidelines; Pollution; Sources

179 NAL Call No: TD224.I2R63 1991
Ten year report. (Rock Creek Rural Clean Water Program final report, 1981-1991.)
Rock Creek Rural Clean Water Program (Idaho); United States, Dept. of Agriculture
Twin Falls, Idaho : The Program,.
328 p. : ill., maps ; 28 cm. April 1991. In cooperation with USDA ... [et al.]. Cover title: Rock Creek Rural Clean Water Program final report, 1981-1991. Includes biblilographical references (p. 241-287).

Language: English

Descriptors: Water quality management; Nonpoint source pollution; Agricultural pollution

180 NAL Call No: 56.8 J822
Terrain analysis: integration into the agricultural nonpoint source (AGNPS) pollution model.
Panuska, J.C.; Moore, I.D.; Kramer, L.A.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 46 (1): p. 59-64; 1991 Jan. Includes references.

Language: English

Descriptors: Terrain; Pollution; Water quality; Erosion; Computer simulation

181 NAL Call No: HC110.W43T48 1993
Theory, modeling, and experience in the management of nonpoint-source pollution.
Russell, Clifford S.; Shogren, Jason F.

Boston : Kluwer Academic Publishers,.
xvii, 345 p. : ill., maps ; 24 cm. (Natural resource management and policy). Papers presented at a workshop sponsored by the Association of Environmental and Resource Economists and held at the University of Kentucky, Lexington, KY, in June 1991. Includes bibliographical references.

Language: English

Descriptors: Water; Agricultural pollution; Water quality management

182 NAL Call No: TD420.A1P7
Three types of approaches to controlling nonpoint source pollution of agrochemicals from golf links in water resources management.
Morioka, T.
Oxford ; New York : Pergamon Press, c1981-.
Water science and technology : a journal of the International Association on Water Pollution Research v. 28 (3/5): p. 549-559; 1993. Paper presented at the IAWQ First International Conference on "Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact, Abatement." September 19-24, 1993, Chicago, Illinois. Includes references.

Language: English

Descriptors: Japan; Cabt; Pesticides; Pollution; Sources; Golf courses; Water pollution; Pollution control

183 NAL Call No: QH545.A1E58
Toxicity of sediments containing atrazine and carbofuran to larvae of the midge Chironomus tentans.
Douglas, W.S.; McIntosh, A.; Clausen, J.C.
Tarrytown, N.Y. : Pergamon Press.
Environmental toxicology and chemistry v. 12 (5): p. 847-853; 1993 May. Includes references.

Language: English

Descriptors: Camptochironomus tentans; Toxicity; Atrazine; Carbofuran; Pesticide mixtures; Runoff; Mortality; Nontarget organisms; Water pollution

184 NAL Call No: TD223.N36 1992
A tracking index for nonpoint source implementation projects.
Dressing, S.A.; Clausen, J.C.; Spooner, J.
Washington, DC : U.S. Environmental Protection Agency.
Proceedings: the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : Sept 13-17, 1992, Orlando, Florida. p. 77-87; 1992. Includes references.

Language: English

Descriptors: Water quality; Pollution control; Water management

185 NAL Call No: TD424.35.I6M67 1991
Use of the Black Creek database to analyze techniques for estimating nonpoint source loadings from small watersheds (May 1988).
Morrison, James; Christensen, Ralph G.
Chicago, Ill. : U.S. Environmental Protection Agency, Great Lakes National Program Office,.
17 p. : ill., map ; 28 cm. PB93-128072. EPA-905/9-91-011. Grant no.R005754-01.

Language: English

Descriptors: Water; Watershed management

186 NAL Call No: S539.5.J68
Using the phosphorus assessment tool in the field.
Stevens, R.G.; Sobecki, T.M.; Spofford, T.L.
Madison, WI : American Society of Agronomy, c1987-.
Journal of production agriculture v. 6 (4): p. 487-492; 1993 Oct. Paper presented at the "Symposium on assessment of potential phosphorus losses from a field site", November 4, 1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Oregon; Cabt; Washington; Cabt; Site class assessment; Phosphorus; Losses from soil; Risk; Indexes; Site factors; Resource management; Water pollution

187 NAL Call No: 292.9 Am34
Validation of AGNPS for small watersheds using an integrated AGNPS/GIS system.
Mitchell, J.K.; Engel, B.A.; Srinivasan, R.; Wang, S.S.Y.
Bethesda, Md. : American Water Resources Association.
Water resources bulletin v. 29 (5): p. 833-842; 1993 Sep. Includes references.

Language: English

Descriptors: Illinois; Cabt; Watersheds; Pollution; Runoff; Sediment; Erosion; Catchment hydrology; Simulation models; Geographical information systems; Integrated systems; Topography

Abstract: The AGNPS (Agricultural NonPoint Source) model was evaluated for predicting runoff and sediment delivery from small watersheds of mild topography. Fifty sediment yield events were monitored from two watersheds and five nested subwatersheds in East Central Illinois throughout the growing season of four years. Half of these events were used to calibrate parameters in the AGNPS model. Average calibrated parameters were used as input for the remaining events to obtain runoff and sediment yield data. These data were used to evaluate the suitability of the AGNPS model for predicting runoff and sediment yield from small, mild-sloped watersheds. An integrated AGNPS/GIS system was used to efficiently create the large number of data input changes necessary to this study. This system is one where the AGNPS model was integrated with the GRASS (Geographic Resources Analysis Support System) GIS (Geographical Information System) to develop a decision support tool to assist with management of runoff and erosion from agricultural watersheds. The integrated system assists with the development of input GIS layers to AGNPS, running the model, and interpretation of the results.

188 NAL Call No: SB475.83.V44 1992
Vegetative practices guide for nonpoint source pollution management., Rev. December 16, 1992.
Hampton Roads Planning District Commission (Va.)
Chesapeake, Va.? : The Commission,.
1 v. (various pagings) : ill. ; 28 cm. Includes bibliographical references.

Language: English

Descriptors: Water quality management; Landscape architecture in water conservation; Nonpoint source pollution

189 NAL Call No: KF3788.U54 1990
Water pollution greater EPA leadership needed to reduce nonpoint source pollution : report to the Chairman and Ranking Minority Member, Subcommittee on Investigations and Oversight, Committee on Public Works and Transportation, House of Representatives. (Greater EPA leadership needed to reduce nonpoint source pollution Nonpoint source pollution.)
United States. General Accounting Office; United States, Congress, House, Committee on Public Works, Subcommittee on Investigations and Oversight
Washington, DC : The Office; GA 1.13:RCED-91-10.
56 p. : map ; 28 cm. Cover title. Running title: Nonpoint source pollution. October 1990. GAO/RCED-91-10. "B-236683", P. [1]. Includes bibliographical references.

Language: English

Descriptors: Water; Water quality

190 NAL Call No: 56.8 J822
Water quality and agariculture: Mississippi experiences.
Cooper, C.M.; Lipe, W.M.
Ankeny, Iowa : Soil and Water Conservation Society of America.
Journal of soil and water conservation v. 47 (3): p. 220-223; 1992 May. Includes references.

Language: English

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